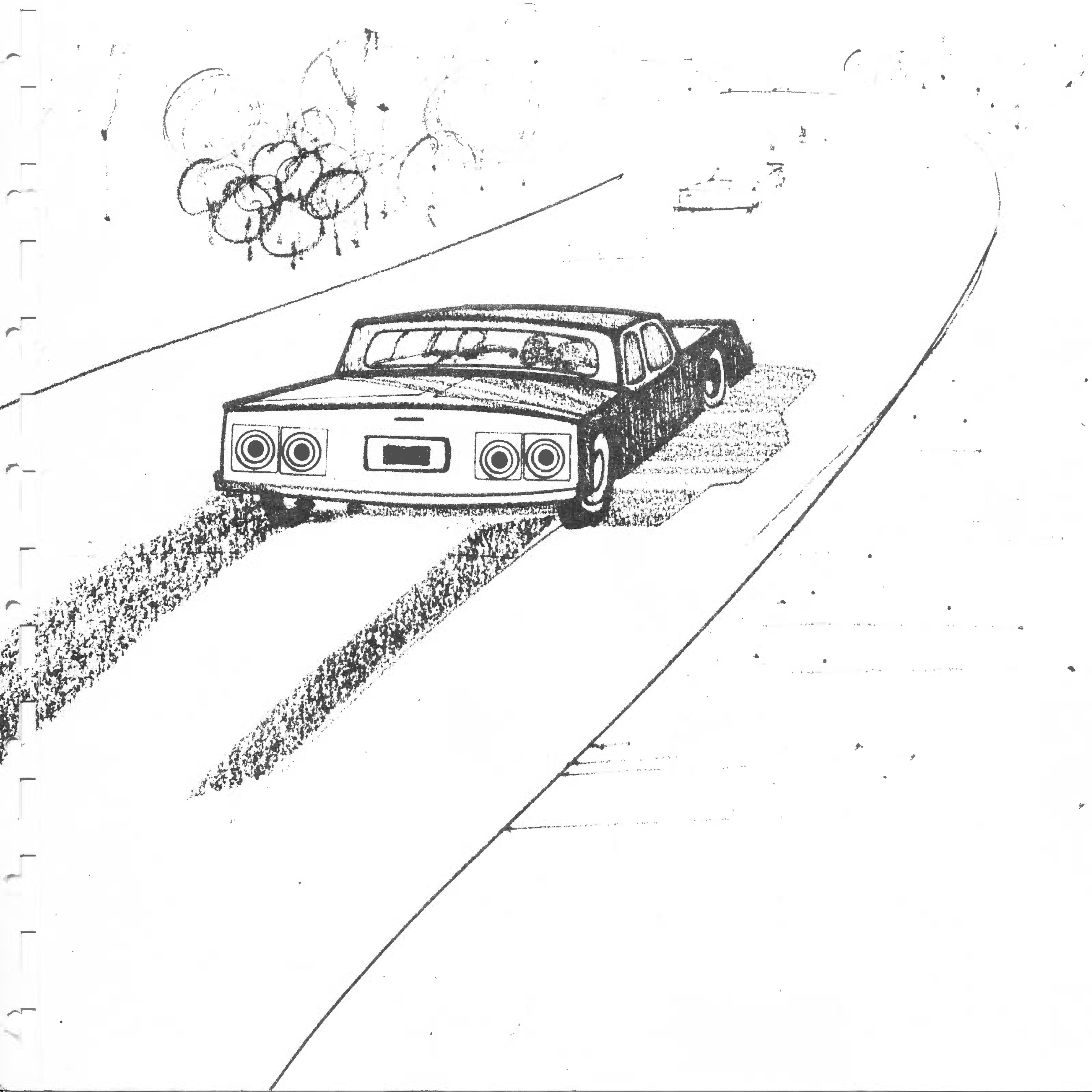
HIGHWAY DATA
OAKLAND COUNTY 1971

OAKLAND COUNTY PLANNING COMMISSION



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HIGHWAY DATA   OAKLAND COUNTY - 1971

OAKLAND COUNTY PLANNING COMMISSION

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DEPARTMENT OF STATE HIGHWAYS HIGHLIGHTS

Michigan's highway construction program traveled a smoother road in fiscal 1969-70 than the year before. The result was an upsurge in the dollar volume of contract lettings.

Without freezes in federal aid to contend with, highway administrators awarded contracts totaling $169 million, up $51 million from the year before. A reduction in expenditures required for right-of-way made more money available for construction, a situation expected to contribute to another increase in contract awards this year and next.

Barring more delays in federal allotments, schedulers foresee $200 million worth of contracts for state highway construction in fiscal 1970-71 and $210 million in the following year. In all probability, the $10 million increase will be eaten up by rising costs of labor and materials.

In mid-1970, 108 miles of freeways and other divided highways were at various stages of construction. When completed, the 96 miles of freeway under construction will raise Michigan's freeway network to nearly 1,500 miles. The total will include 996 miles of the state's 1,175-mile segment of the Interstate freeway system that will link nearly every city in the 48 contiguous states with a population topping 50,000.

Michigan also has 519 miles of divided highways not built to freeway standards, with another 12 miles under construction.

The State Highway Commission, observing a "decade of extraordinary progress" in 1960-70 in building Michigan's freeway system, proposed an equally ambitious program for the 1970's.

It is designed to keep the state reasonably in pace with large and growing traffic volumes.

Charles H. Hewitt, Commission chairman, noted that while Michigan's population grew by 13 per cent in the 1960's, the number of registered vehicles went up by 33 per cent. The mileage driven increased by 52 per cent, nearly four times as fast as the population.

The Commission's three-year extension of its current program commits it for the first time to an eight-year program. It provides for some 200 projects, including extension of 12 freeways, and is expected to cost about $670 million by the time it is completed.

The accelerated freeway program provides for construction of 802 miles of freeway, although part of a 281-mile stretch running east and west across the Upper Peninsula could involve widening of existing US-2.

Allowing for inflationary trends, engineering, right-of-way and construction costs could hit $1.5 billion or more. State Highway Director Henrik E. Stafseth said all the freeway projects could be placed under contract by 1980 if the Legislature approved a $39-million-a-year tax increase needed to finance revenue bonds totaling $500 million.

The Commission recommended that Michigan's cities, villages and counties ask for a similar tax increase to take care of their most urgent road and street construction needs.

A significant milestone in 1970 was the completion of downtown Detroit's freeway network. Opening of the final leg of the Fisher Freeway (I-75) will help preserve and strengthen the vitality of the downtown area of the nation's fifth largest city, making it more accesible to residents of the sprawling metropolitan area and to motorists outstate and outside Michigan.

Other major projects opened to traffic during 1969-70 included:

--12 miles of US-131 Freeway, running north from Grand Rapids to just south of Cedar Springs at M-57. Another segment extending to M-46 north of Howard City will be placed under contract in 1971.

--4.7 miles of I-496, serving Lansing and East Lansing off I-96. The final segment of the freeway was to be opened in late 1970.

--A key segment of M-78 Freeway, bringing it from I-75 into downtown Flint. The western end will be the terminus of I-69 Freeway running north from the Indiana border to Lansing and Flint.

Eight more miles of I-75 southeast of West Branch were ready for opening, leaving only a small section at the I-696 interchange in Royal Oak and 36 miles southeast of Grayling still to go on Michigan's segment of the freeway. I-75 will run from Miami, Florida, north to Sault Ste. Marie.

The Commission announced that work will begin next summer, a year and a half ahead of schedule, on the final 24 miles of I-196 to run from Holland to the southwest suburbs of Grand Rapids. Work also is being pushed ahead on extending Northwestern Highway in Oakland County.

A 6.3-mile segment of I-69 running north from I-94 near Marshall is nearing completion. Work is beginning on a nine-mile section to take the freeway north to Charlotte.

These were among other significant and interesting developments in Michigan's highway program during the last year:

--The Highway Department, in concert with the State Attorney General's office, began a crackdown on billboards erected in illegal positions along Michigan's freeway system. Hundreds of such signs will be removed as the state moves from one freeway to another to enforce the state's billboard control act of 1966.

--State engineers completed the first annual safety inspection of more than 4,800 bridges under requirements of a year-old state law. The Department has embarked on a program to replace all 22 truss-type bridges still on the state highway system.

--Three more rest areas were opened along the freeway system, raising Michigan's total to 59.

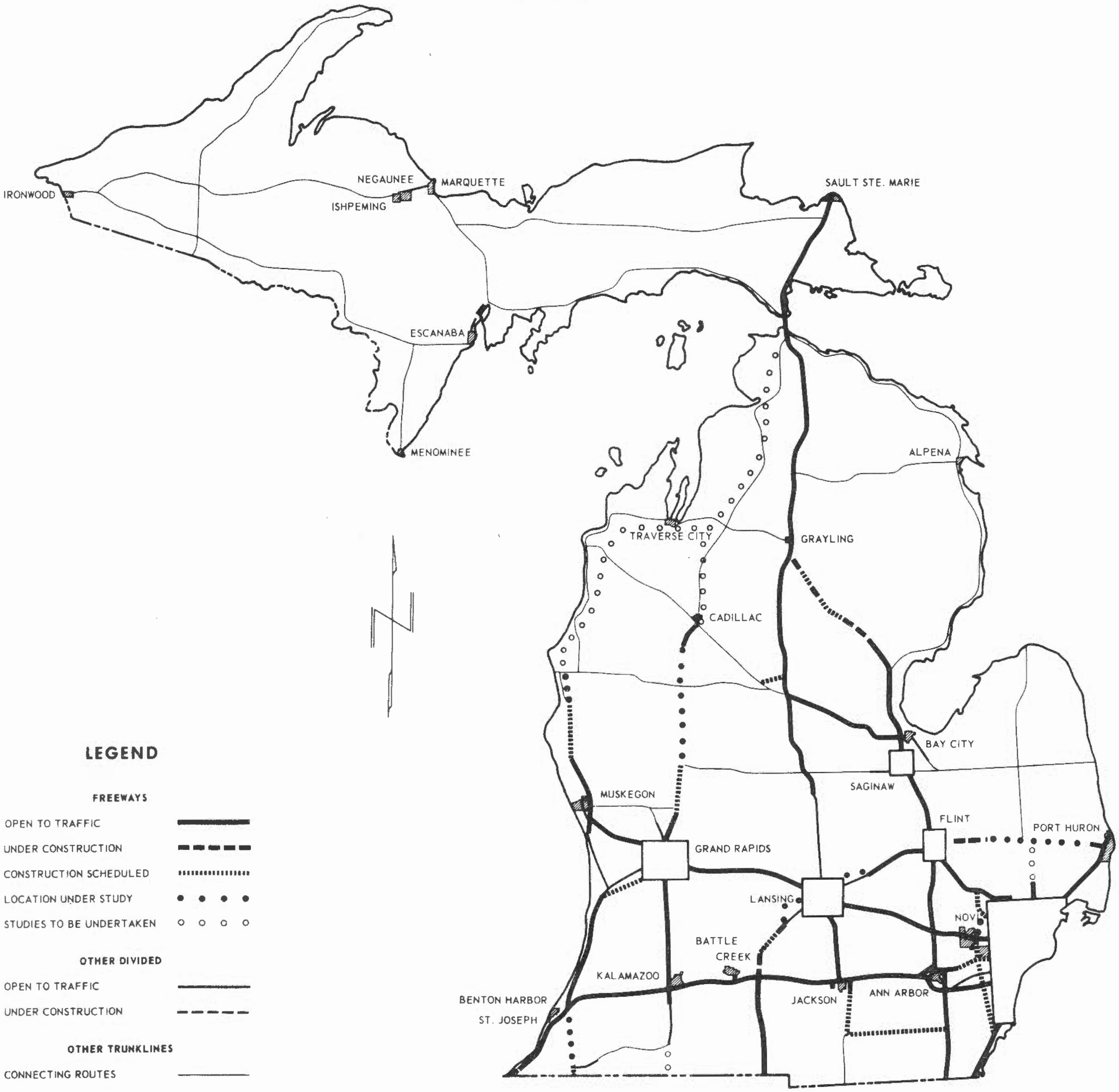
--Contracts were let for the first projects under the federal Traffic Operations Program to Increase Capacity and Safety (TOPICS). It will provide $9 million a year in federal matching money to reduce traffic congestion and hazards in Michigan cities.

Nearing completion is a study of highway, road and street needs in Michigan through 1990. It is being made jointly by the Highway Department, the County Road Association of Michigan and the Michigan Municipal League and will serve as a guide for planning and financing during the next two decades.

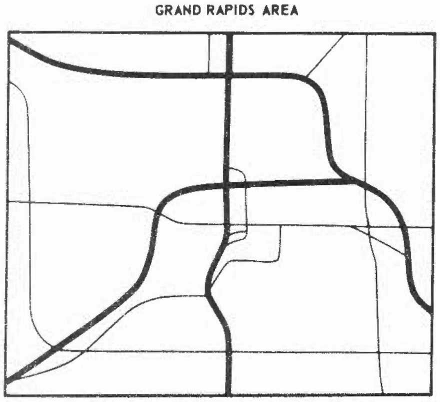
The make-up of the Commission was the same as the year before. Gov. William G. Milliken appointed Charles H. Hewitt to another four-year term and designated him to continue as chairman. Other members are Wallace D. Nunn, East Tawas, vice-chairman; and Louis A. Fisher, Grosse Pointe Shores, and Claude J. Tobin, Escanaba.

INTERSTATE, ARTERIAL & MAJOR DIVIDED HIGHWAYS

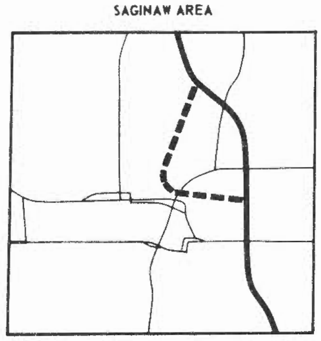
AS OF JULY 1, 1970



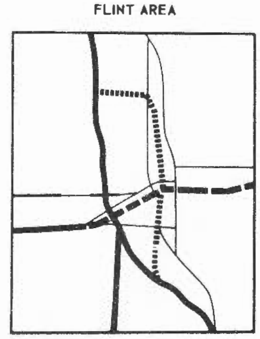
GRAND RAPIDS AREA



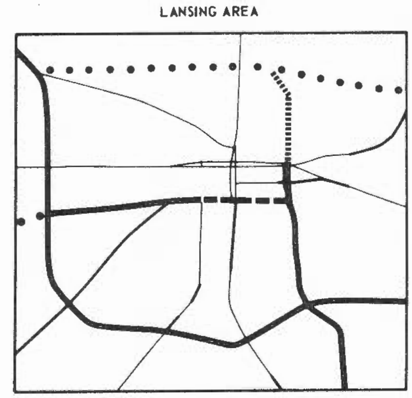
SAGINAW AREA



FLINT AREA

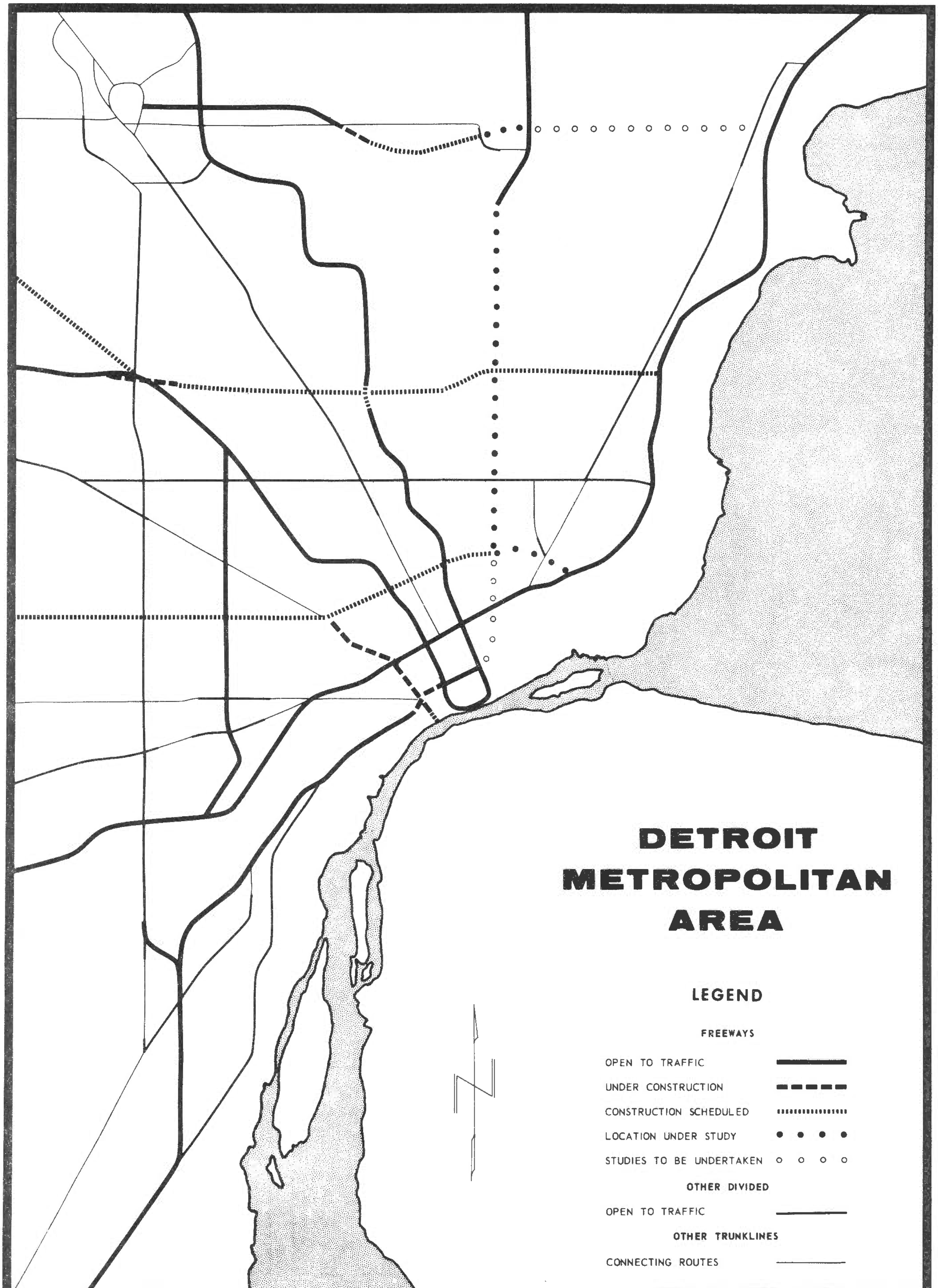


LANSING AREA



INTERSTATE, ARTERIAL & MAJOR DIVIDED HIGHWAYS

AS OF JULY 1, 1970



REPORT OF
DEPARTMENT OF STATE HIGHWAYS
FISCAL YEAR 1970

Capital outlay for construction and improvement of Michigan's State highways in fiscal year 1970 was the sixth largest in the sixty-four year history of the Department. Total funds obligated for engineering, right-of-way and construction awards amounted to $197.7 million. This compares to $294.8 million obligated in fiscal year 1961, the highest in the Department's history, and to an average of $207.9 million per year in the last ten years.

Capital outlay includes yearly contract awards obligating the Department over several fiscal years, coupled with annual expenditures for engineering and land acquisition. Included in the fiscal year total were $126.4 million in contract awards and $71.3 million for engineering and land acquisition compared to $222 million and $73 million, respectively, in the record year.

Actual disbursement for completed projects, and those in progress, amounted to $193.5 million in fiscal year 1970, compared to $203.6 million in fiscal 1969.

With the opening of 3.1 miles of I-496 in Lansing and 1.5 miles of I-69 near Flint, Michigan's Interstate System of 1,175 miles is now 79% complete.

Construction is continuing on the balance of the Interstate System with approximately 25 miles of I-75, 13 miles of I-69, 2 miles of I-94, 5 miles of I-96, 3 miles of I-496, and 8 miles of I-675 presently under construction. Of this mileage under construction, 9.6 miles are in the Detroit area and 4.2 miles in Detroit are scheduled to open in September 1970.

In the ten-year period, ending June 30, 1970, over 6,223 miles of State highways have been improved, relocated, reconstructed or are in the process of construction. Many of these projects were stop-gap improvements to defer the actual time of reconstruction. In spite of these improvements, 7,714 miles or 83.7% of the 9,221.4 miles of State highways are still inadequate to serve present traffic requirements, either because of structural deficiencies or because of inadequate traffic capacity. In addition, 680 bridges were reported inadequate and should be replaced as soon as possible.

During the year the Safety Improvement Program continued to eliminate accident-prone locations and reduce accidents. Programs were also continued on the Interstate and Federal-Aid Primary Systems to increase the aesthetics of these systems in accordance with the highway beautification program. This year also marked the first full year operation of the Traffic Operations Program to Increase Capacity and Safety (TOPICS).

More detailed reports covering progress, condition, biennial construction programs, and a report on receipts and disbursements as required by Act 51 follow. Also included are reports covering the status of the Department's construction program, a report on maintenance operations, and highlights of other activities accomplished by the Department in fiscal 1970.

STATUS OF THE CONSTRUCTION PROGRAM

In 1957, the Department inaugurated a policy of establishing a series of five-year construction programs (example: 1957 to 1962, 1962-1967 and 1967-1972), based upon priorities set by road deficiencies and available funds. The method of determining priorities was revised in 1961 when the Highway Sufficiency Rating was developed. The programs included schedule dates for construction bid lettings and accomplished the important purpose of providing the Transportation Planning, Right-of-Way, Design, and Construction Divisions with target dates to which their individual activities should be geared. Schedules also provided the highway construction industry with the necessary information to anticipate and organize their activities and, therefore, it is believed, to submit lower bids for construction projects.

In 1969 Departmental policy was revised to provide for a continuing 5-year program in which a new year was added to the program at the end of each fiscal year. This continuing program enabled the Department to have a 5-year program in progress rather than wait until near the end of the specified 5-year program to announce the next 5-year program. The new continuing program was again changed in 1970 from 5 years to 8 years to meet the additional requirements in the Federal-Aid Highway Act of 1968. The new 8 year continuing program is based upon the priorities indicated in the annual Highway Sufficiency Ratings.

Construction obligations during the period July 1, 1960 to June 30, 1970, consisting of contract awards, and expenditures for engineering and right-of-way were made as follows:

1961 Fiscal Year	$ 294,790,265
1962 Fiscal Year	224,818,417
1963 Fiscal Year	173,693,985
1964 Fiscal Year	150,688,677
1965 Fiscal Year	181,634,796
1966 Fiscal Year	227,793,328
1967 Fiscal Year	209,073,500
1968 Fiscal Year	235,868,676
1969 Fiscal Year	183,371,258
1970 Fiscal Year	197,678,771
Total	$ 2,079,411,673

A portion of the monies obligated during prior years was for preliminary engineering and right-of-way for projects scheduled for future bid lettings. It is anticipated that $200 million in construction projects will be awarded during the 1971 fiscal year, with an additional $60 million obligated for engineering and right-of-way. At the close of the 1970 fiscal year, the Department had $155.9 million of construction work under contract, and $628 million of road and structure design work in progress.

During fiscal year 1970, 21.0 miles of divided highways were added to the State Highway System. Of this mileage, 4.6 miles were Interstate and 16.2 miles were built to fully controlled access (Freeway) standards on other state highway routes.

STATE TRUNKLINE
CONSTRUCTION PROGRESS REPORT
JULY 1, 1969 - JUNE 30, 1970

Construction progress for the 1969-1970 fiscal year including all types of road and bridge projects is listed below:

Type of Work	Miles Completed	Miles Under Construction
Divided Roadway:		
Interstate	4.646	53.066
Interstate (Wid. Reconst. Resurf.)	9.400	9.176
Freeway (Not Interstate)	16.226	23.846
Freeway (Wid. Reconst. Resurf.)	--	0.459
Other Divided (New Construction)	0.212	2.480
Additional Lanes or Reconst. on Exist. Div.	23.606	23.720
One-Way Street System	--	2.385
Single Roadway:		
New Construction	7.185	19.173
Concrete	0.410	3.705
Bit. Resurface on Rigid	136.255	108.884
Bit. Resurface on Non-Rigid	111.665	90.857
G&DS, Prime & Double Seal	--	15.593
Non-Skid Surface Treatment	--	3.552
Totals	309.605	356.896

Structures Completed 69
Structures Under Construction 217

NOTE: Bituminous Resurfacing on Rigid & Non-Rigid may include some Dual Roadway as records were not kept separately on Reconstruction and Resurfacing for Divided Roadway until July 1, 1967.

PROGRESS ON INTERSTATE AND ARTERIAL ROUTES

I-69 Indiana State Line N'ly and NE'ly via Lansing to I-75 West of Flint

Stage	Miles	
Open to Traffic	64.4	
Under Construction	14.1	
Construction Scheduled	10.2	
Construction Planned	42.6	
Status on I-96	5.2	1/
Total	131.3	

1/ Not included in I-69 total.

Two sections of I-69 are open to traffic, 38 miles from the Indiana State line north to I-94 near Marshall and 26 miles from Old M-78 in Shiawassee County to I-75 west of Flint.

The section from I-94 north to Garfield Road is under construction and scheduled to open via a temporary connector to US-27 late in 1970. Also under construction is a 5.9 mile section that is a dualing of the Charlotte By-pass. Scheduled for construction in late 1970 is the section between Garfield Road and the Charlotte By-pass. The remainder of I-69, from north of Charlotte north and easterly to the completed section in Shiawassee County is in the planing stage, and should be scheduled to be placed under construction in stages starting in 1974.

I-75 Ohio State Line to Sault Ste. Marie via Detroit

Stage	Miles
Open to Traffic	343.1
Under Construction	24.8
Construction Scheduled	25.7
Total	393.6

All but 50.5 of the 393.6 miles of I-75 are completed and open or soon to be opened to traffic.

In Detroit, the 4.2 section from Vernor to the Chrysler Freeway has been completed and will open to traffic in early September. The 1.4 mile section at the location of the I-696 interchange is scheduled to be placed under construction in August 1970.

Other major sections of I-75 under construction are from M-33 north to West Branch, scheduled to open November 1970; from US-27 south of Grayling south and east to M-76, scheduled to open November 1970; and from M-76 near Roscommon south and easterly to Nine Mile Hill Road, scheduled to open late 1971. Until the remaining sections of I-75 in Ogemaw and Roscommon Counties are completed (scheduled to be placed under construction in 1971) traffic will continue to be routed via Freeway routes US-10 and US-27 so as to provide a continuous facility from the Ohio State Line near Sylvania, Ohio through Detroit to the Saginaw-Bay City area, west to Clare then north via the Mackinac Bridge to the Soo.

Reconstruction, repairs, modernization and safety projects that were completed or started this fiscal year are as follows: Reconstruction of the 14-mile I-75 Interchange, improvements of the US-23-I-75 Interchange, paving on outer shoulders from US-23 - I-75 Interchange to Birch Run, 27.4 miles of median guard rail and bituminous shoulders in Monroe County, screening of pedestrian bridges in Detroit and repairs of settlement on the east approach to the Zilwaukee Bascule bridge caused by an underlying layer of soft clay and silt.

I-94 Indiana State Line at New Buffalo via Detroit to Port Huron

State		Miles
Open to Traffic		274
Under Construction		2
	Total	276

I-94 now provides a continuous 274-mile Freeway from M-239 near New Buffalo and the Indiana State Line, to and through Detroit, northeasterly to the Blue Water Bridge in Port Huron. The remaining two miles of I-94, from existing I-94 south to the Indiana State Line was placed under construction in March 1970.

Other construction on existing I-94 in fiscal 1970 consisted of 24 miles of new bituminous shoulders from Lawrence to Kalamazoo in Van Buren and Kalamazoo Counties; a temporary asphalt section .3 of a mile long, east of Albion, was removed and replaced with concrete, after abandonment and removal of the railroad tracks for the line from Albion to Springport; a grade separation was placed under construction at Harris Road, southeast of Ypsilanti in Washtenaw County.

I-96 Muskegon to Detroit via Grand Rapids and Lansing

State		Miles
Open to Traffic		163.9
Under Construction		5.4
Construction Scheduled		24.1
	Total	193.4

I-96 from Muskegon to Farmington, 164 miles, is complete and open to traffic. Presently I-96 is connected via I-696 and US-10 (formerly I-696 BS) to the center of Detroit.

There are 5.4 miles of I-96 under construction from Lafayette to Elmhurst, and a 2-mile section from Lafayette to I-94 is scheduled to open to traffic in early 1971. The balance of I-96, 24.1 miles, is scheduled to be placed under construction by the end of 1972.

I-196, I-275, I-475, I-496, I-675 and I-696

I-196 - 56.2 miles open to traffic
21.9 miles scheduled for construction

I-275 - 30.0 miles scheduled for construction

I-475 - 16.8 miles scheduled for construction

I-496 - 8.5 miles open to traffic
3.4 miles under construction (scheduled to open late 1970)

I-675 - 7.7 miles under construction

I-696 - 8.3 miles open to traffic
1.5 miles completed - not open
18.4 miles scheduled for construction

These routes comprise the remainder of the penetrating or peripheral Interstate routes to be completed in or around Michigan's larger urban areas. Status of the routes range from open to traffic to scheduled for construction.

US-27 Lansing North to I-75, Crawford County

Stage		Miles
Open to Traffic		98.7
Traveled Way		36.5
	Total	135.2

The major section of US-27, from south of Ithaca north to I-75 south of Grayling, has been improved to freeway standards and is open to traffic.

The remaining 36.5 miles is 4-lane divided with no control of access (traveled way) from Lansing to south of Ithaca.

US-127 Ohio State Line North to US-27 in Clinton County

Stage	Miles
Open to Traffic	36.3
Construction Scheduled	15.5
Traveled Way	24.1
Status Carried on Interstate	6.9
Total	82.8

Of the 83 miles planned for this Freeway route, 36.3 miles are presently completed and open to traffic including a new 1.3 mile section from the junction of I-496 north to Saginaw Street in Lansing.

The remaining 39.6 miles are in pre-construction stages.

US-131 Indiana State Line North to Petoskey

Stage	Miles
Open to Traffic (Freeway)	74.6
Construction Scheduled	18.6
Traveled Way	156.8
Approved Location	3.0
Status Carried on Interstate	2.7
Total	255.7

A 76 mile section of four-lane divided highway is in use from Three Rivers north to I-96 north of Grand Rapids which includes 62 miles of Freeway. A section of full control Freeway from I-96 north to M-57 extension, 12 miles, opened to traffic in December 1969. Construction is scheduled for an additional 18.6 miles north to M-46 near Howard City. A 3 mile section south of Cadillac is built to Freeway Standards.

M-21 - I-75 in Flint to US-25

Stage	Miles
Open to Traffic	6.2
Under Construction	20.4
Construction Scheduled	1.0
Approved Location	13.6
Traveled Way	27.5
Total	68.7

A 2.9 mile section of M-21 Freeway, from I-75 east to near I-475, is nearing completion. The remaining mileage between I-475 and M-24 is under construction, with the section from Howe Road easterly to M-15 open to local traffic. The balance of the route from M-24 east to the existing Freeway is soon to be scheduled for construction.

Completed Routes - Interstate, Arterial and Other Freeway

I-194 — I-94 south of Battle Creek north to I-94 BL, M-37 and M-66 in the center of Battle Creek.
Length 3.4 miles.

I-296 — I-196 in Grand Rapids north to I-96 north of Grand Rapids.
Length 3.4 miles.

I-375 — In Detroit - St. Antoine Street at Jefferson Avenue east and north to I-75.
Length 1.1 miles.

US-23 — Ohio State Line north to I-75 south of Flint.
Length 90.5 miles.

M-39 — Southfield Expressway in the Detroit Metropolitan Area.
Length 14.0 miles.

I-696 BS — Northwestern Highway, James Couzens and John C. Lodge Expressways in Detroit Metropolitan Area.
Length 18.3 miles.

Primary Routes - Construction in Progress

M-52 — New, 10 miles from Webberville south in Ingham County.

M-139 — Berrien County, from I-94 north to Pipestone Avenue.

M-140 — Van Buren County, from Aylesworth Avenue to US-31 in South Haven.

M-43 — Kalamazoo County, from west of US-131 easterly to Sage St.

Primary Routes - Cont'd

M-44	Kent and Ionia Counties from Rams Dell Drive easterly to M-66.
M-46	Muskegon County, from Brooks Road easterly to Maple Island Road.
M-20	Newaygo County, from Hesperia easterly to M-37.
M-82	Newaygo County, from north of M-120 northerly to Hesperia.
M-61	Clare County, from the Muskegon River east to Harrison.
US-23	Alcona County, from the south county line north to Harrisville.
M-76	Ogemaw County, from I-75 at Cook Road northeasterly to existing M-76 southeast of West Branch.
M-54	(Dort Highway) - Genesee County, from Kent Street north to Lapeer Street.
US-25	Huron County, from M-53 in Port Austin easterly to Huron City.
M-24	Lapeer County, from M-21 (relocated) north to Existing M-21.
M-43	Ingham County, from Okemos Road east to Short Street.
US-127	Ingham County, from the Red Cedar River north to Woodruff Street in Lansing.
US-127	Jackson County, Interchange and service roads at Springport north of Jackson.
US-12 BR	(Future) - Washtenaw County two-way pair from Monroe Street north to Michigan Avenue in Ypsilanti.
M-204	3 1/3 miles from M-22 east to the Village of Lake Leelanau.
M-52	Four miles from Bennington Road north to Krause Road in Owosso.
M-57	2 1/2 miles from US-131 (relocated) easterly to Tefft Ave.
M-81	1 1/2 miles from 5th Street northeasterly to 25th Street in Saginaw.
M-83	1 3/4 miles from Townline Road north in Frankenmuth.
M-33	1/2 mile connector from I-75 to M-76.
M-15	1/3 of a mile at the south limits of Davison.
US-131 BR	(Plainfield Ave.) 2 1/2 miles from I-96 north to Airway St.
M-43	1.2 miles from Catherine Street east to Logan in Lansing.
M-57	1/2 mile from east city limits of Clio east to M-54.

HIGHWAY CONSTRUCTION PROJECT AWARDS

FISCAL YEAR 1969-70

County	Route Number	Type of Work	Location Description	Miles	Award Amount
Muskegon	M-46	G&DS, Agg. Bse., Crs. & Bit. Conc., Surf.	E. of Brooks Rd., E'ly to E. of Maple Island Rd.	4.103	$ 1,740,473.00
Newaygo	M-20	Bit. Agg. Surf. Crs.	Crosswell Ave. to Tulip St.	5.985	151,167.20
Newaygo	M-82	Bit. Agg. Surf. Crs.	Fr. Muskegon-Oceana Co. Line N'ly to Hesperia	6.946	122,479.18
Newaygo	M-37	Bit. Agg. Surf. Crs.	C&O RR Crossing N. of One Mile Rd.	0.190	2,091.00
Oakland	I-696	G&DS, Service Rds., Util. Alter. & 7 Structs. & Pumphouse	I-696 & I-75 Interchange	---	6,372,336.87
Oakland	I-696	G&DS, 12' & 36' Conc. Pav't Wid., & 1 Structure	Telegraph Rd., SE'ly to near Lahser Rd.	0.871	678,854.90
Oakland	M-24	G&DS, 2@48' Conc., Pav't	S. of Exeter Dr., N'ly to N., of Shallow Brook Dr.	0.772	935,775.09
Oakland	M-24	Bit. Patching & Resurf.	S. of SCL of Lake Orion N. to N. of Shadbolt St.	0.670	27,285.00
Oakland	M-150	G&DS, 2@16' to 25' Bit. Conc. Surf.	S. of S. Blvd., N'ly to S. of M-59	0.373	285,216.36
Oakland	M-59	G&DS, 2@24' Conc., Pav't & 4 Structs.	Auburn Rd., SE'ly to W. of Dequindre Rd.	2.971	3,486,860.35

HIGHWAY CONSTRUCTION PROJECT AWARDS

FISCAL YEAR 1969-70

County	Route Number	Type of Work	Location Description	Miles	Award Amount
Ogemaw	I-75	G&DS, 2@24' Conc., Pavt. & 3 Structs.	S. Co. Line NW'ly to SE of Cook Rd.	6.998	$ 4,894,576.65
Ogemaw	I-75 BL	G&DS & 24' Conc., Pav't.	Cook Rd., NE'ly to M-76	1.520	476,212.23
Ogemaw	M-33	Bit. Agg. Surf., Crs.	N. of M-55 N'ly to SCL of Rose City	9.838	234,399.80
Ontonagon	M-64 & M-28	Bit. Agg. Surf. & Prime & Double Seal	Soo Line RR Crossing to Merriweather	8.567	163,008.60
Ontonagon	M-26 & M-28	20' & 24' Bit. Agg., Surf. Crs.	US-45 NE'ly to Copper Range RR Crossing & on M-28	16.761	475,984.72
Ontonagon	US-45, Rel.	G&DS, 24' & 44' Bit. Agg. Surf., & 1 Structure	Int. M-26 NW'ly to Steel St., in Ontonagon	13.188	4,062,078.57
Oscoda	M-33	Bit. Agg. Resurf.	S. of Ogemaw Co. Line N'ly to Mio	9.714	146,017.40
Ottawa	M-45	G&DS, Agg. Bse, Crs. Bit. Conc. Surf.	Vicinity of 42nd St.	0.288	71,645.28
Ottawa	US-31	Traffic Islands & Bit. Conc. Surf.	Fr. Madison St., N'ly to N. of Monroe St.	0.205	33,654.85
Roscommon	I-75	G&DS, 2@24' Bit., Conc. Pav't & 1 Struct.	Nine Mile Hill Rd., N'ly to W. of M-18	6.843	3,593,848.74

BOARD OF COUNTY ROAD COMMISSIONERS

OAKLAND COUNTY

2420 PONTIAC LAKE ROAD
PONTIAC, MICHIGAN 48054

FEDERAL 8-4571

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CLERK OF THE BOARD

L. W. MCENTEE
ASSISTANT
CORPORATION COUNSEL

To Whom It May Concern:

This brochure has been prepared as an aid to you and your constituents in the realization of our aims and purposes in establishing and promulgating the Master Right-of-Way Plan.

Southeastern Michigan is rapidly changing from a rural and semi-rural area to an urban area. Current projections show that Oakland County will be totally urbanized by 1990. The Oakland County Road Commission, in order to keep pace with this growth, developed a Master Right-of-Way Plan for Oakland County.

The majority of the road system will transfer to local jurisdiction as each area incorporates. The adoption of a right-of-way plan will be of increased benefit to the local governmental unit in the future.

The Road Commission, acting through the Inter-County Highway Commission, will be contacting all local governments to review and adopt a local right-of-way map. The maps will then be printed by the Road Commission for distribution by the local governmental units.

For further information, call 338-4571.

BOARD OF COUNTY ROAD COMMISSIONERS
OF THE COUNTY OF OAKLAND, MICHIGAN

Sol D. Lomerson, Chairman

Paul W. McGovern, Vice Chairman

Frazer W. Staman, Commissioner

tal

In 1925 the Master Plan for Detroit and Environs (the map on the following page) was prepared and adopted by the City of Detroit and the former Rapid Transit Commission in collaboration with the Road Commissions of Oakland, Wayne, and Macomb Counties and the authorities of the included municipalities.

The Master Plan called for right-of-way widths on mile roads of 120 feet and of 86 feet on half-mile roads. Also included in the system was a network of superhighways having 204 feet of right-of-way. It is essentially these superhighways that have become the backbone of our transportation system. Woodward Avenue, Northwestern Highway, Base Line Road and Telegraph Road are remaining superhighways of the original plan. Schoolcraft and the remainder of Northwestern Highway will soon follow Stephenson Highway, Southfield Road and James Couzens as superhighways which have been converted to freeways.

Although the 1925 Master Plan was widely accepted, its execution lacked the enforcement by local governments which is of prime importance to a regional plan. Consequently, today we are faced with costly problems such as the I-696 controversey. Had Eleven Mile Road been built as it was proposed in the Master Plan, I-696 may have been a reality some time ago.

The map on the following page illustrates the projected chronological spread of the urban area in Southeastern Michigan. It is important to recognize that Oakland County is rapidly becoming the center of this urban development.

To meet the demands of growth and further economic development, an adequate transportation system must be developed to handle today's traffic needs and those that accompany further urbanization.

In 1953 the Oakland County Road Commission adopted and recorded a Master Plan of Right-of-Way (found in the pocket at the rear) which deals directly with the challenge of growth in the county. The plan was amended in 1958, 1964, and 1968 to insure its usefulness. The only major change since its inception was the inclusion in 1968 of the superhighway network. The network and the cross sections pertinent to each width of right-of-way on the county plan are on the following pages.

Using the 1925 Master Plan as an example, it is apparent that more than just approval of the revised county plan is necessary in order to accomplish its goals. Each individual unit of government within the county must establish and enforce restrictions on platting and zoning that will allow the plan to evolve into the adequate transportation system everyone needs and wants.

FUTURE URBANIZATION

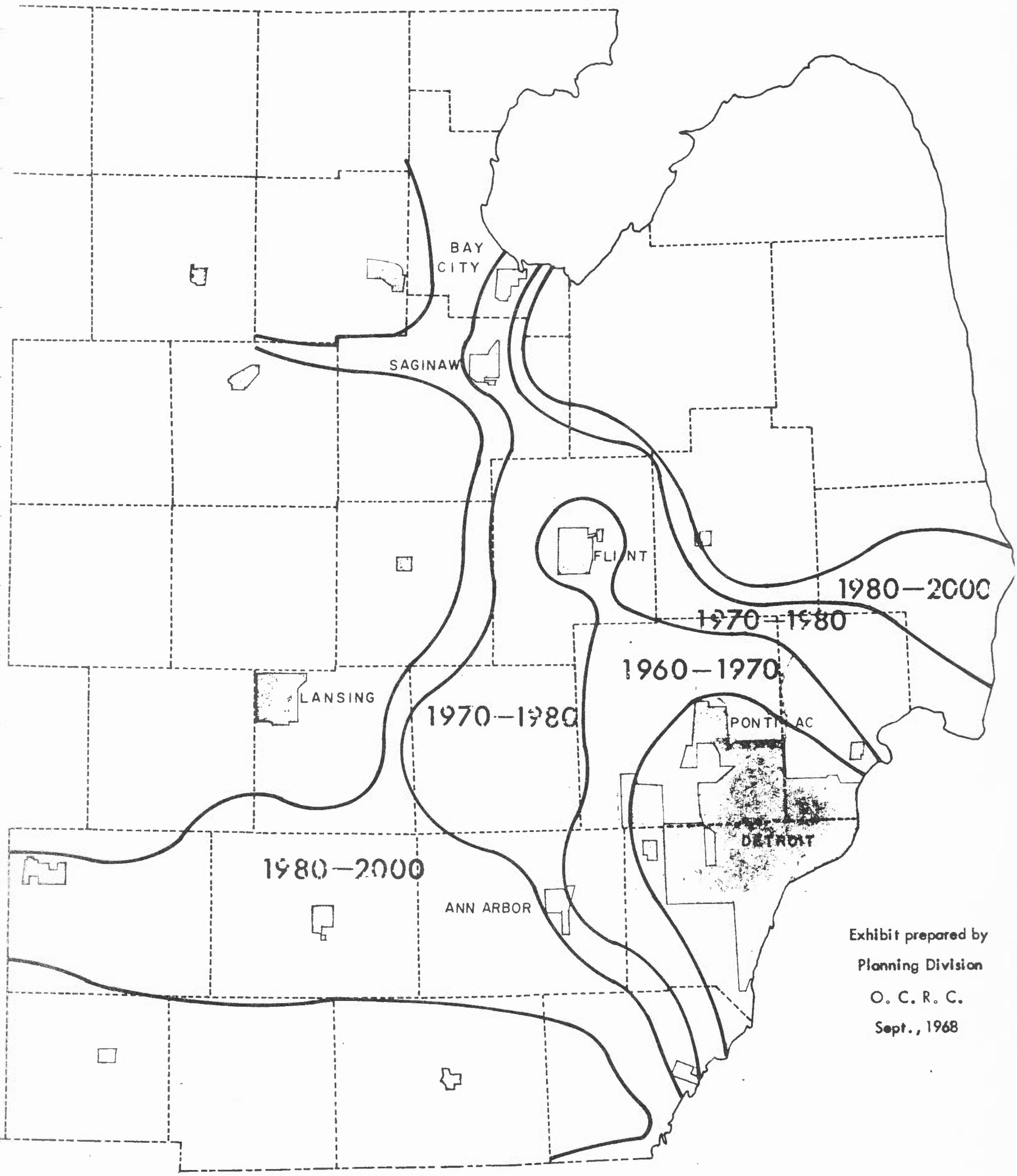


Exhibit prepared by
Planning Division
O. C. R. C.
Sept., 1968

Source: Emergence and Growth of an Urban Region, - DOXIADIS Associates

The Inter-County Highway Commission has contacted each local agency by letter requesting adoption of the Plan and incorporation of its setback requirements within their ordinances. Upon adoption by the local governmental units, an individual brochure for each governmental agency will be published, an example of which (Bloomfield Township) is included in this report.

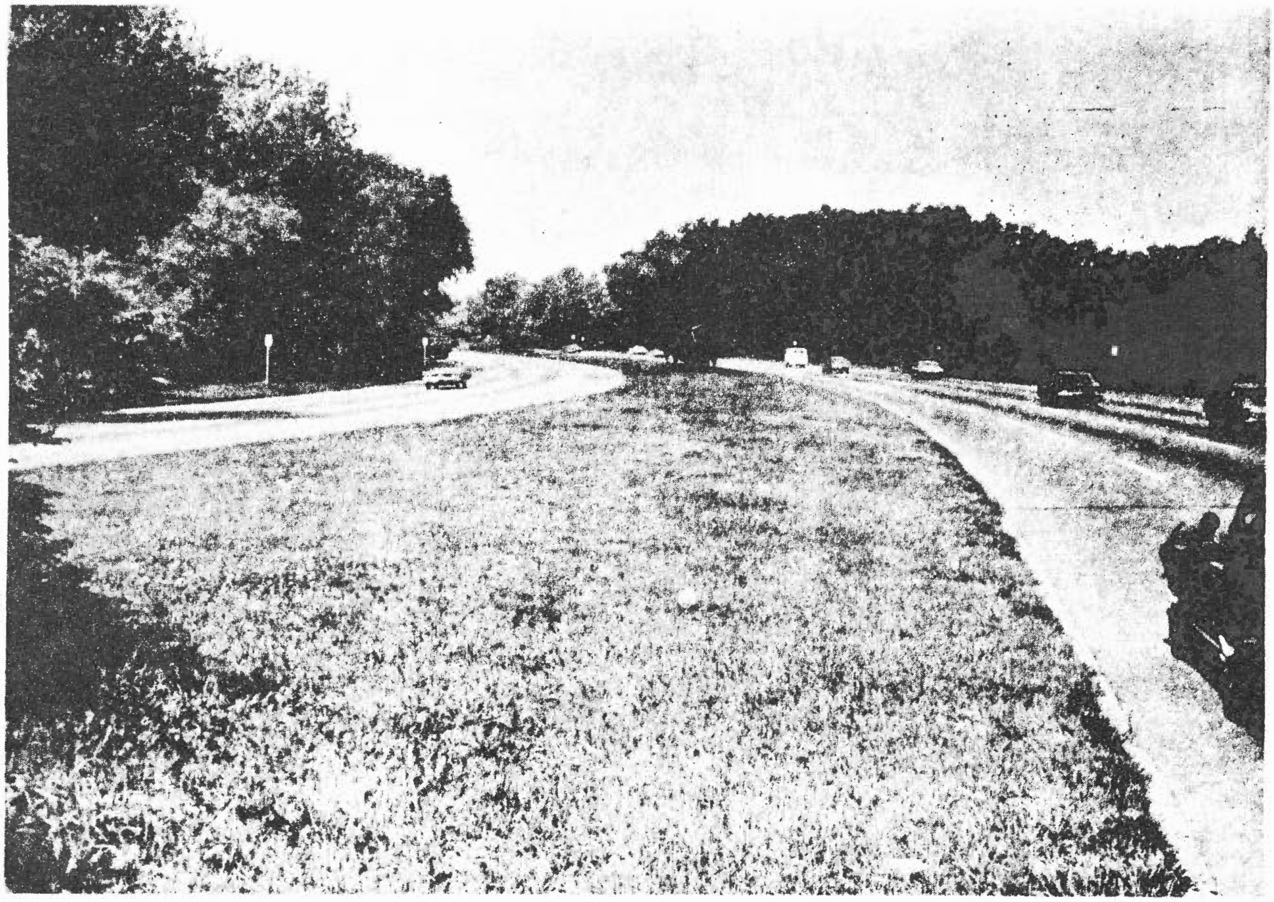
The adoption and enforcement of the Plan is the critical part in the success of the program. We urge all governmental agencies to act positively on this proposal and avoid the problems of inaction. A method of enlightening individual local citizens and developers is the attachment by the building department of a brochure to each building permit application.

It is our desire that every governmental unit in Oakland County will endorse this Plan and proceed vigorously in its implementation. If further information is desired you may contact the:

Inter-County Highway Commission
24719 Van Dyke
Center Line, Michigan 48015

or

Oakland County Road Commission
2420 Pontiac Lake Road
Pontiac, Michigan 48054



In growth areas the rewards of proper planning and its subsequent fulfillment are many. Examples of this can be found in several areas of Oakland County. In the super-highway classification (204 feet right-of-way) Hunter Boulevard is representative of what can be achieved by the enforcement of the Master Right-of-Way Plan. Here we have a high class facility which enhances the high property values of the surrounding area.

The picture above of Twelve Mile Road is an example of 120 feet right-of-way. Note the setback of the subdivision line which allows for further expansion of pavement width.

On the following page we see prime examples of inadequate right-of-way conditions. The top picture of a typical rural area shows clearly the results of development without regard for right-of-way requirements. The bottom picture illustrates the same condition in an urban area.

RIGHT OF WAY

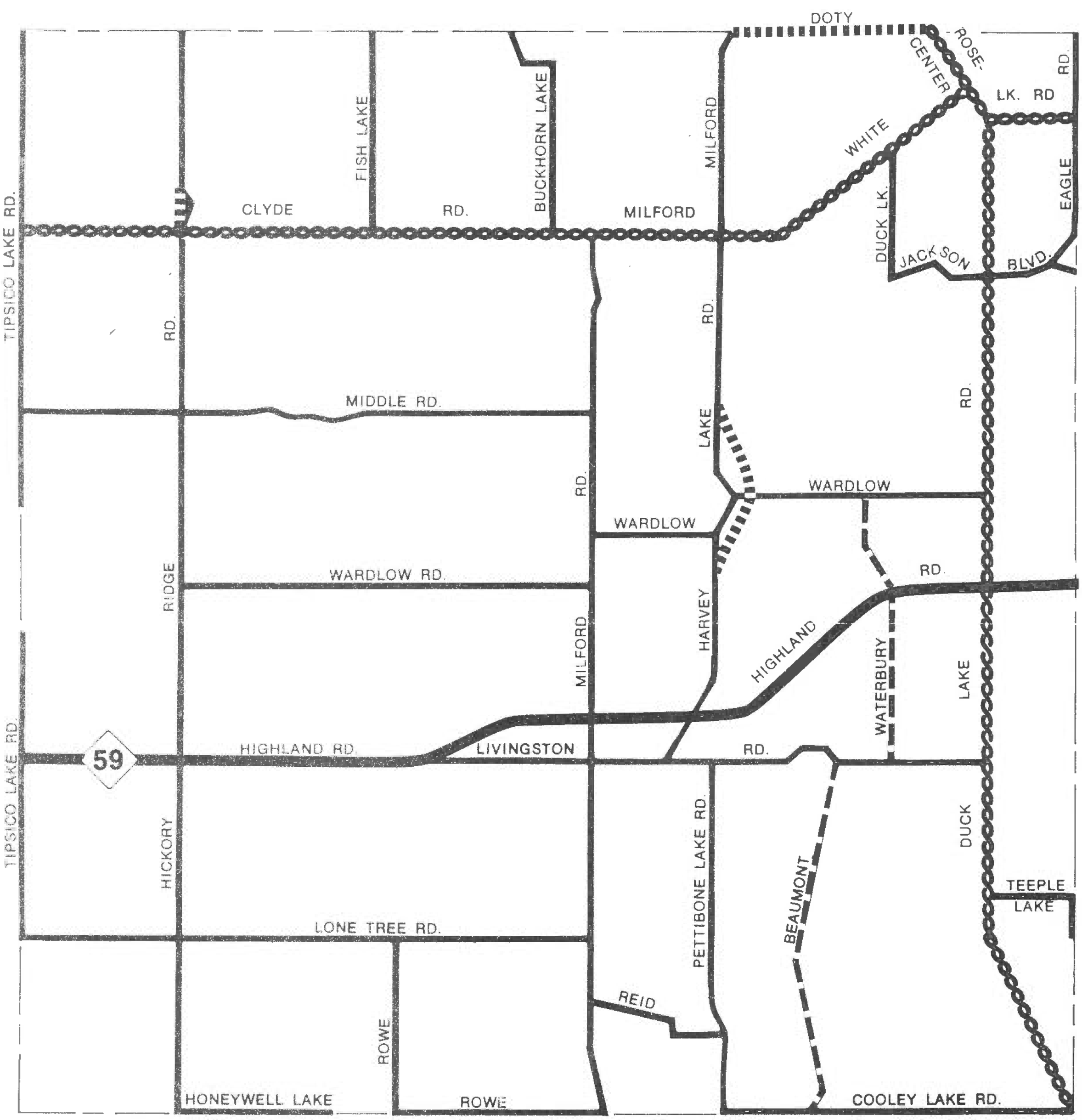
Legend

RIGHTS-OF-WAY

- 204 FOOT **SUPER - HIGHWAY**
- 150 FOOT **STATE TRUNKLINE**
- 120 FOOT **THOROUGHFARE**
- 86 FOOT **COLLECTOR**
- ROUTE UNDER STUDY

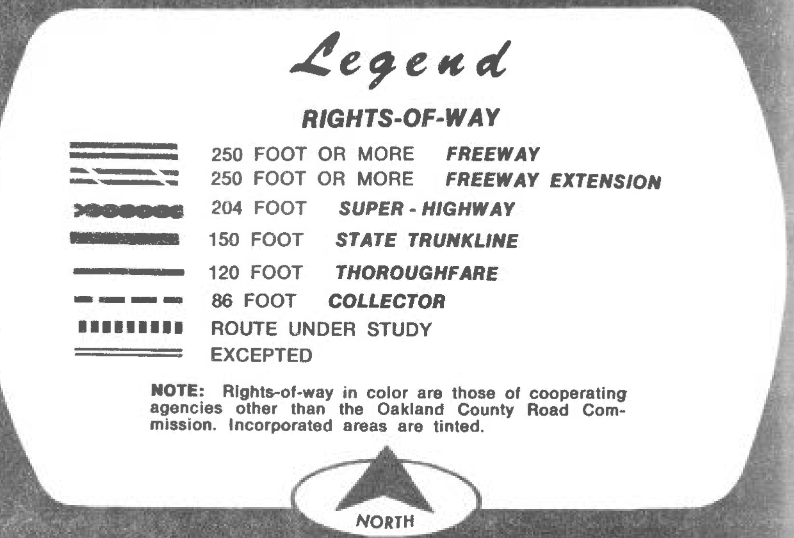
NOTE: Rights-of-way in color are those of cooperating agencies other than the Oakland County Road Commission. Incorporated areas are tinted.

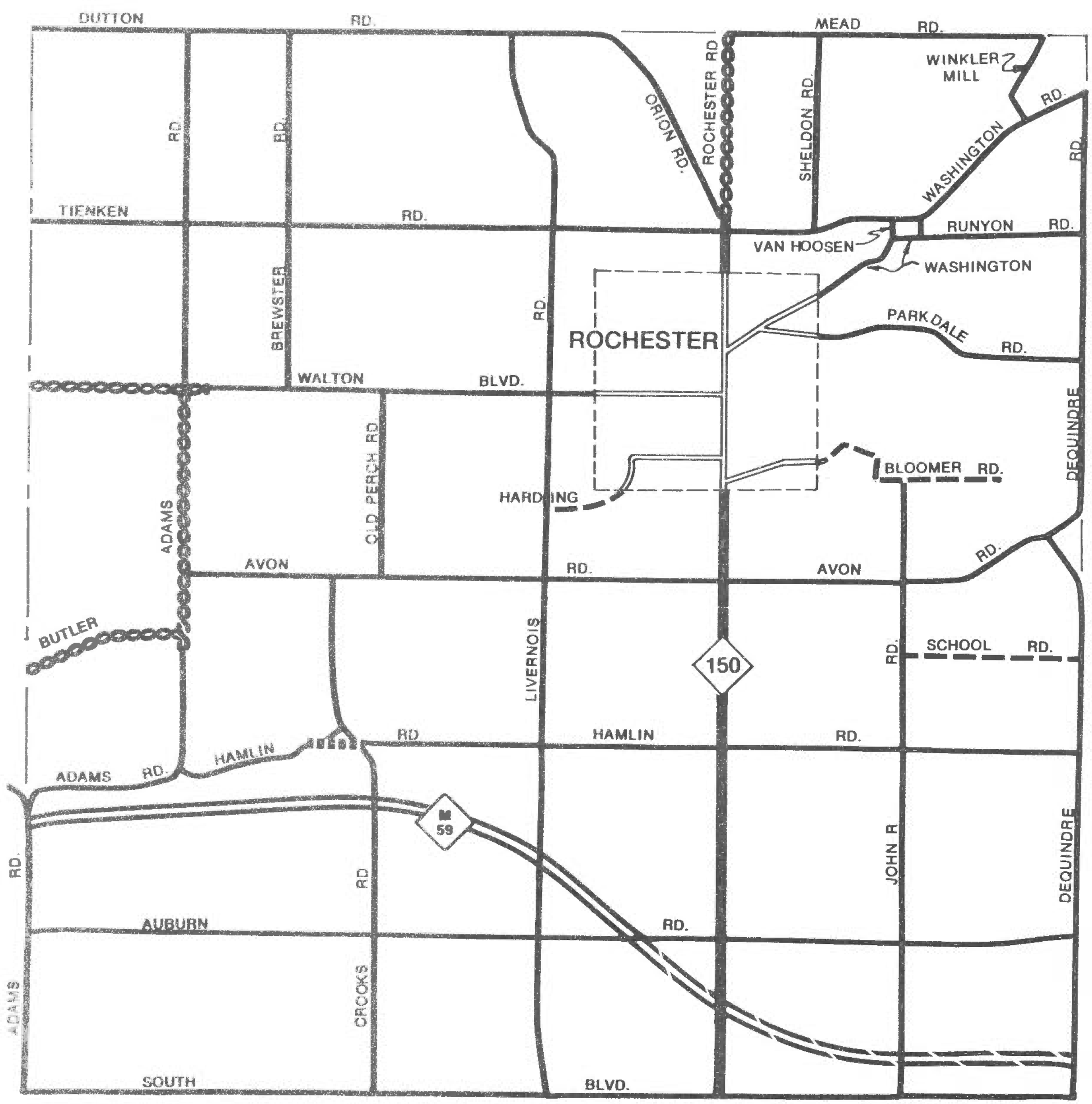
NORTH



AVON TOWNSHIP

RIGHT OF WAY REQUIREMENTS





COMMERCE WALLED LAKE WOLVERINE LAKE

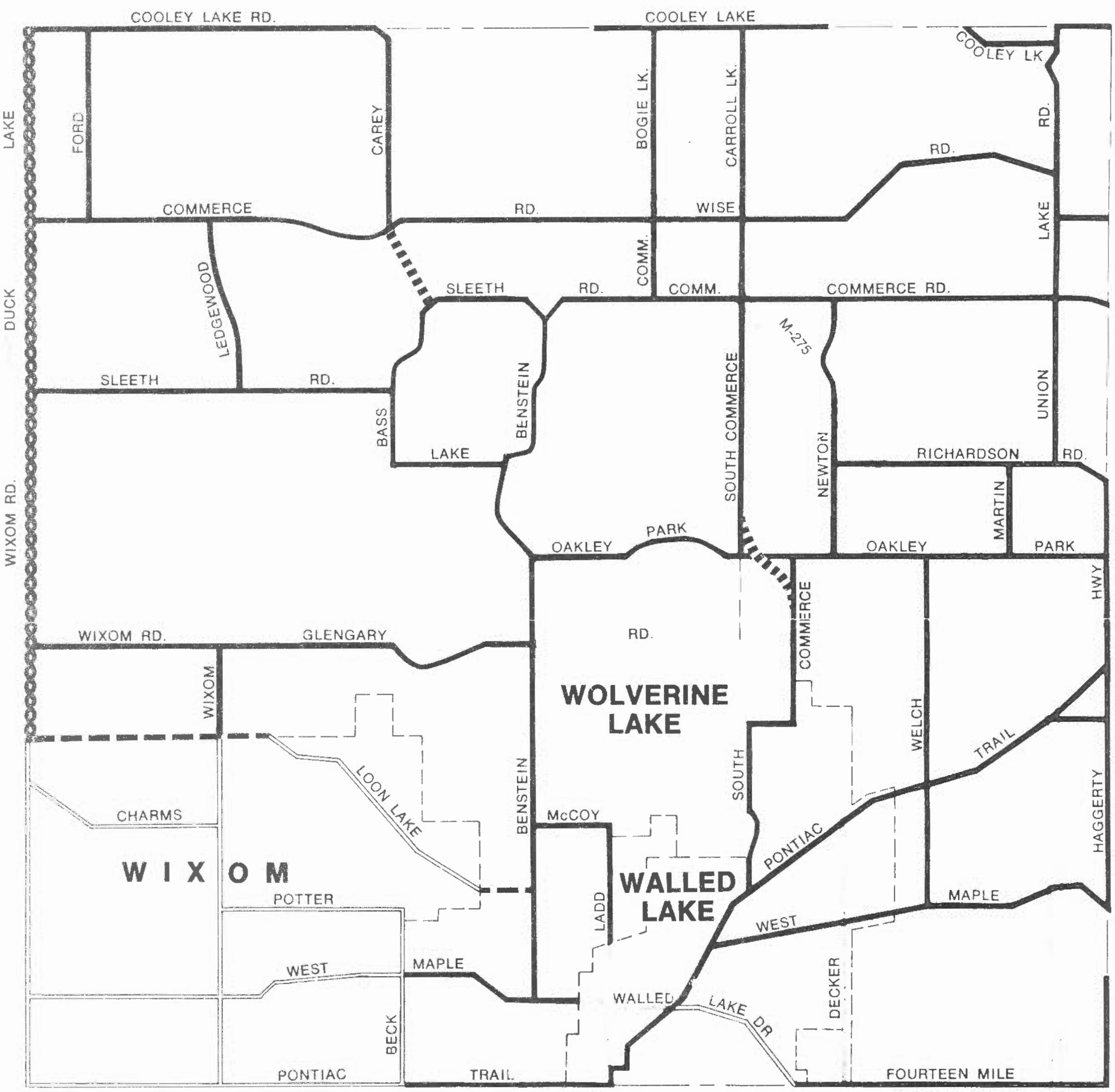
REQUIREMENTS

RIGHTS-OF-WAY

	250 FOOT OR MORE	***FREEWAY EXTENSION***
(beaded line)	204 FOOT	***SUPER - HIGHWAY***
(solid line)	120 FOOT	***THOROUGHFARE***
(dashed line)	86 FOOT	***COLLECTOR***
(double line)	EXCEPTED	
(hatched line)	ROUTE UNDER STUDY	

NOTE: Rights-of-way in color are those of cooperating agencies other than the Oakland County Road Commission. Incorporated areas are tinted.

NORTH



Prepared by the Oakland County Road Commission in cooperation with the Inter-County Highway Commission of Southeastern Michigan

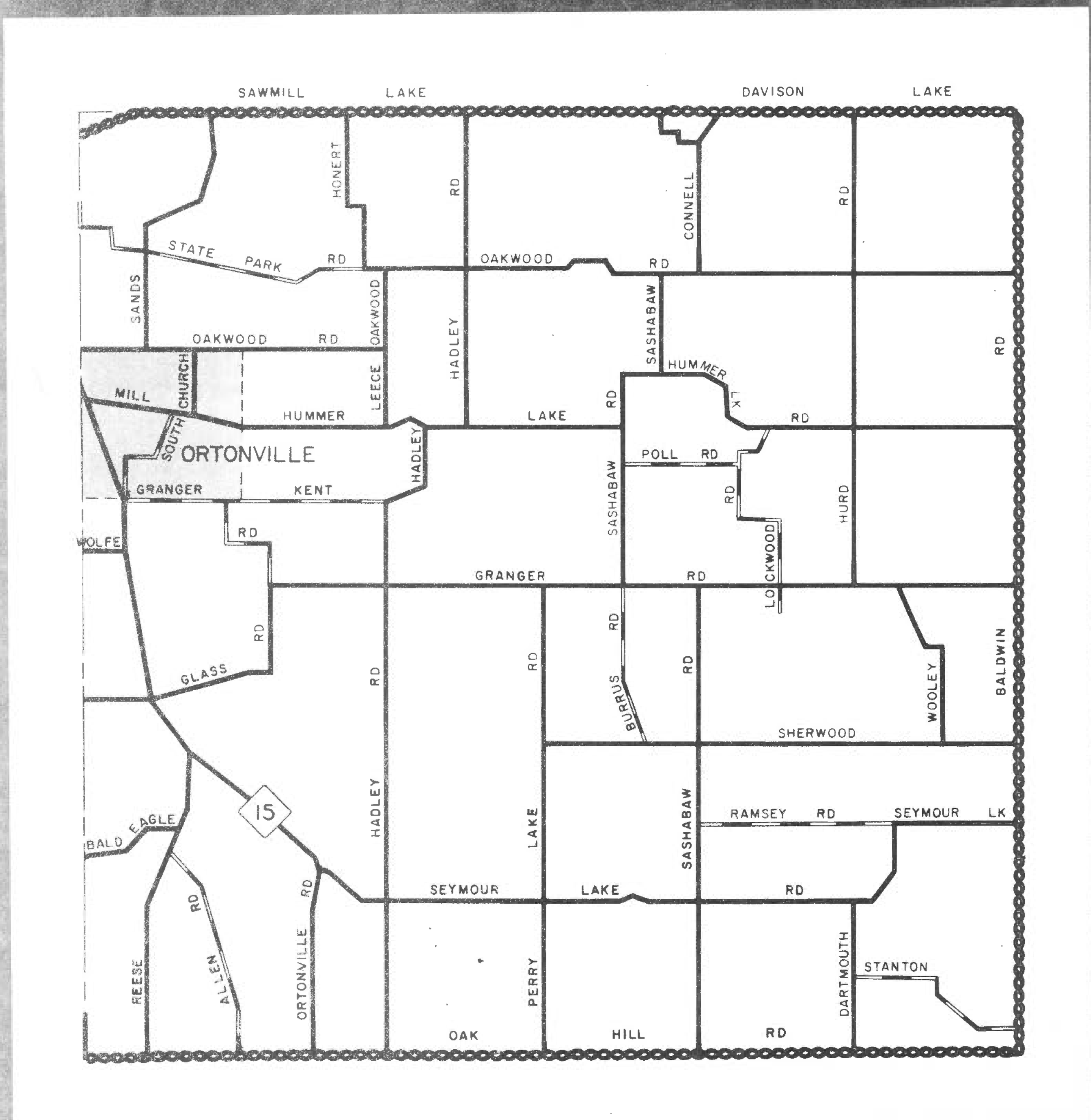
BRANDON ORTONVILLE

REQUIREMENTS

Legend

- 204 FOOT RIGHT-OF-WAY
- 120 FOOT RIGHT-OF-WAY
- 86 FOOT RIGHT-OF-WAY

NORTH



RIGHT OF WAY

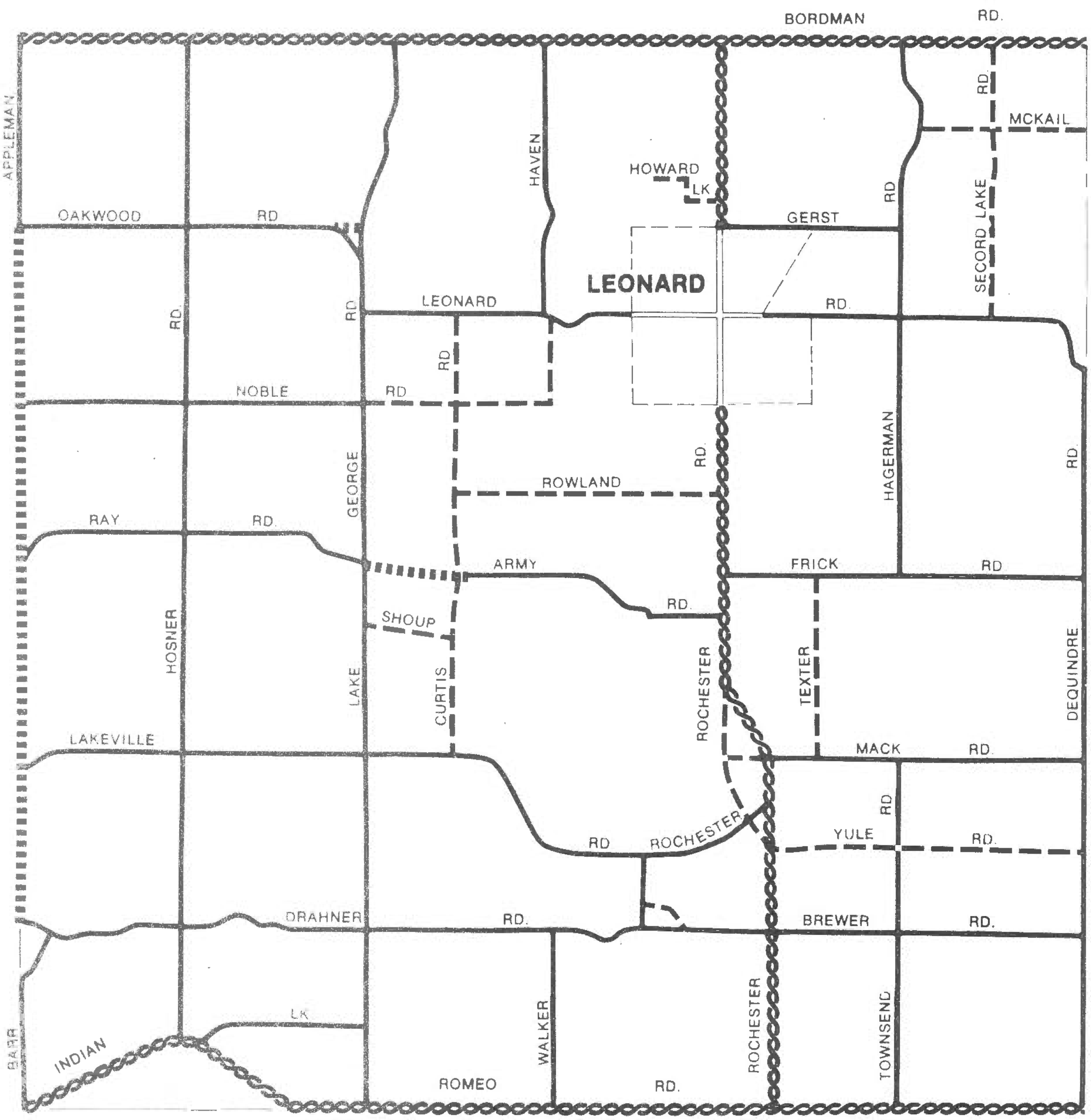
Legend

RIGHTS-OF-WAY

204 FOOT **SUPER - HIGHWAY**
120 FOOT **THOROUGHFARE**
86 FOOT **COLLECTOR**
ROUTE UNDER STUDY
EXCEPTED

NOTE: Rights-of-way in color are those of cooperating agencies other than the Oakland County Road Commission. Incorporated areas are tinted.

NORTH



CITY OF NOVI

REQUIREMENTS

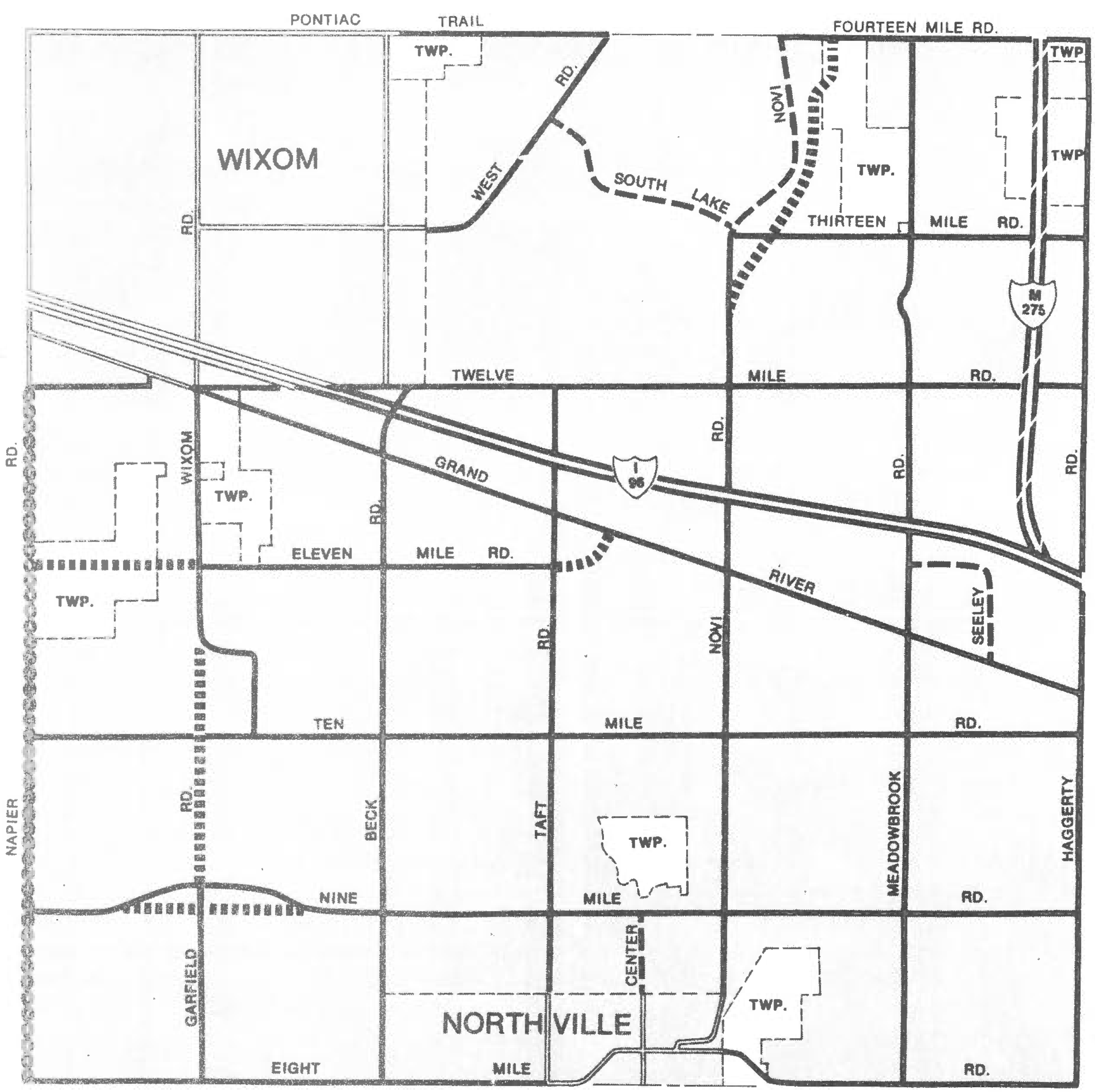
Legend

RIGHTS-OF-WAY

- 250 FOOT OR MORE — **FREEWAY**
- 250 FOOT OR MORE — **FREEWAY EXTENSION**
- 204 FOOT — **SUPER - HIGHWAY**
- 120 FOOT — **THOROUGHFARE**
- 86 FOOT — **COLLECTOR**
- ROUTE UNDER STUDY
- EXCEPTED

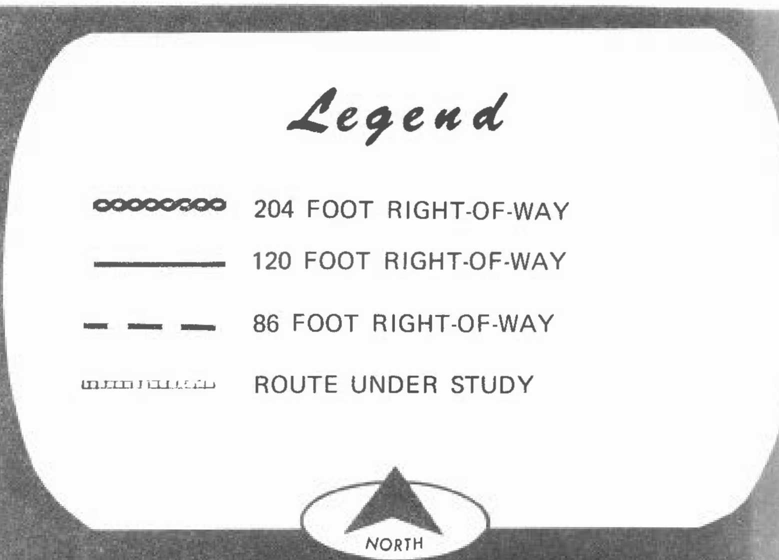
NOTE: Rights-of-way in color are those of cooperating agencies other than the Oakland County Road Commission. Incorporated areas are tinted.

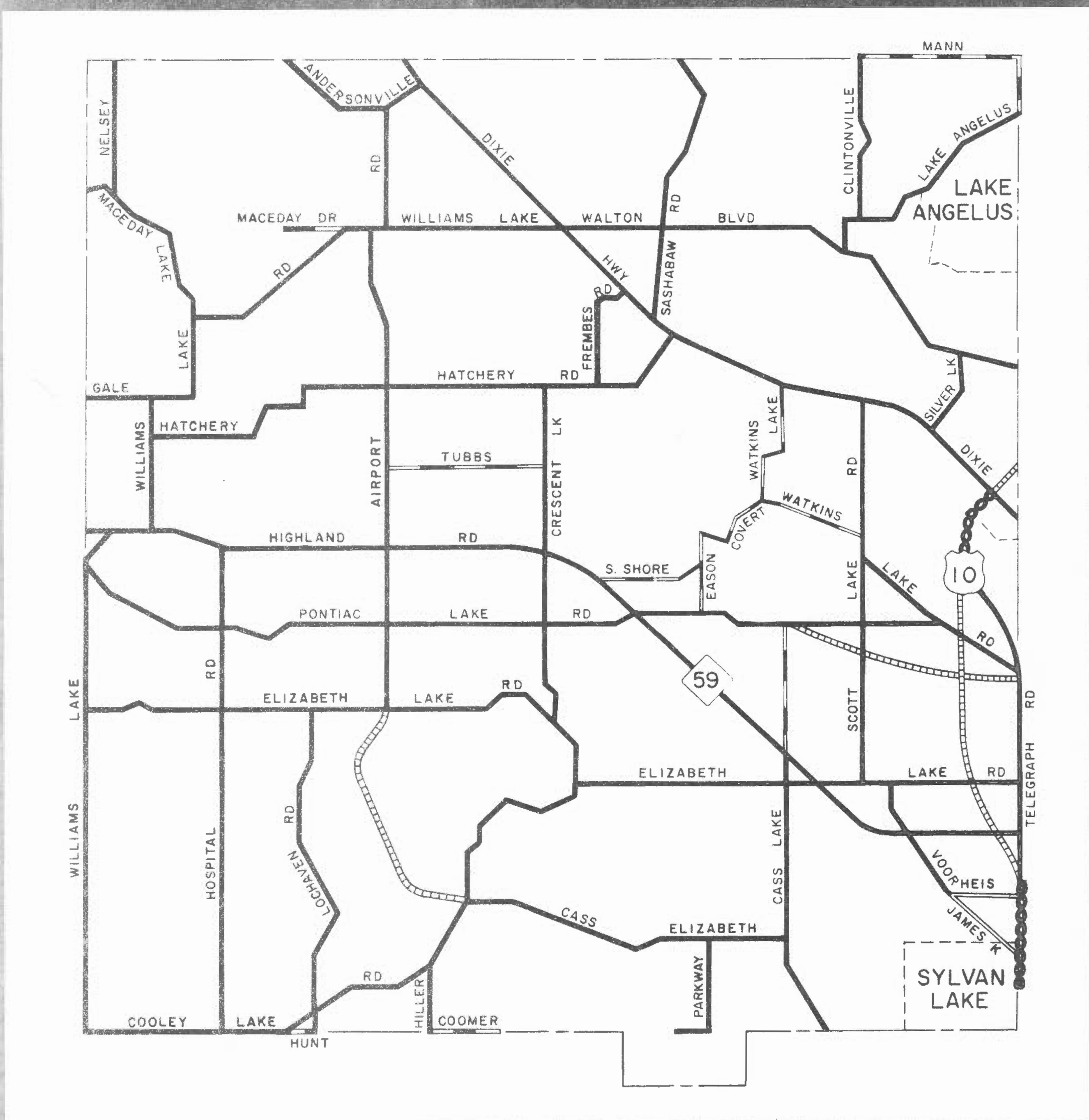
NORTH



TOWNSHIP

REQUIREMENTS



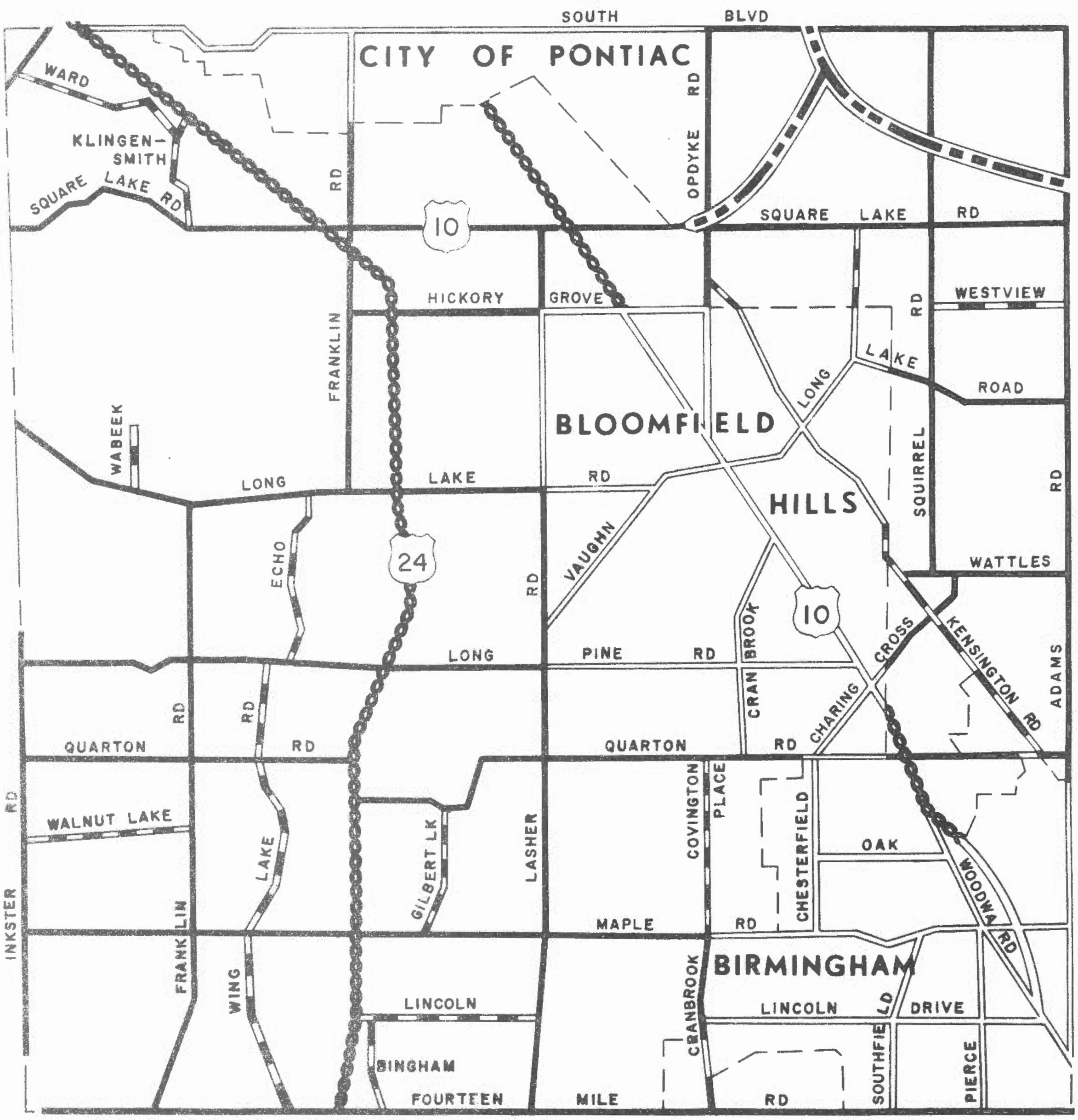


TOWNSHIP REQUIREMENTS

Legend

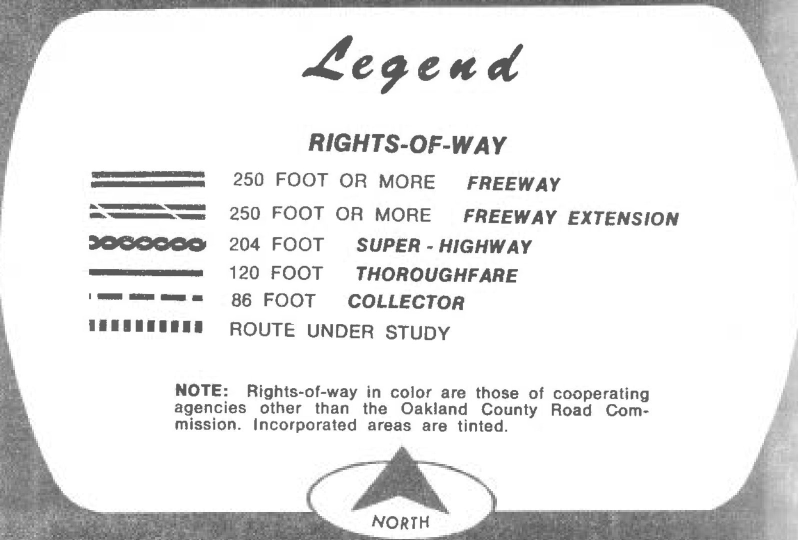
- FREEWAY RIGHT-OF-WAY 250 FOOT OR MORE
- 204 FOOT RIGHT-OF-WAY
- 120 FOOT RIGHT-OF-WAY
- 86 FOOT RIGHT-OF-WAY

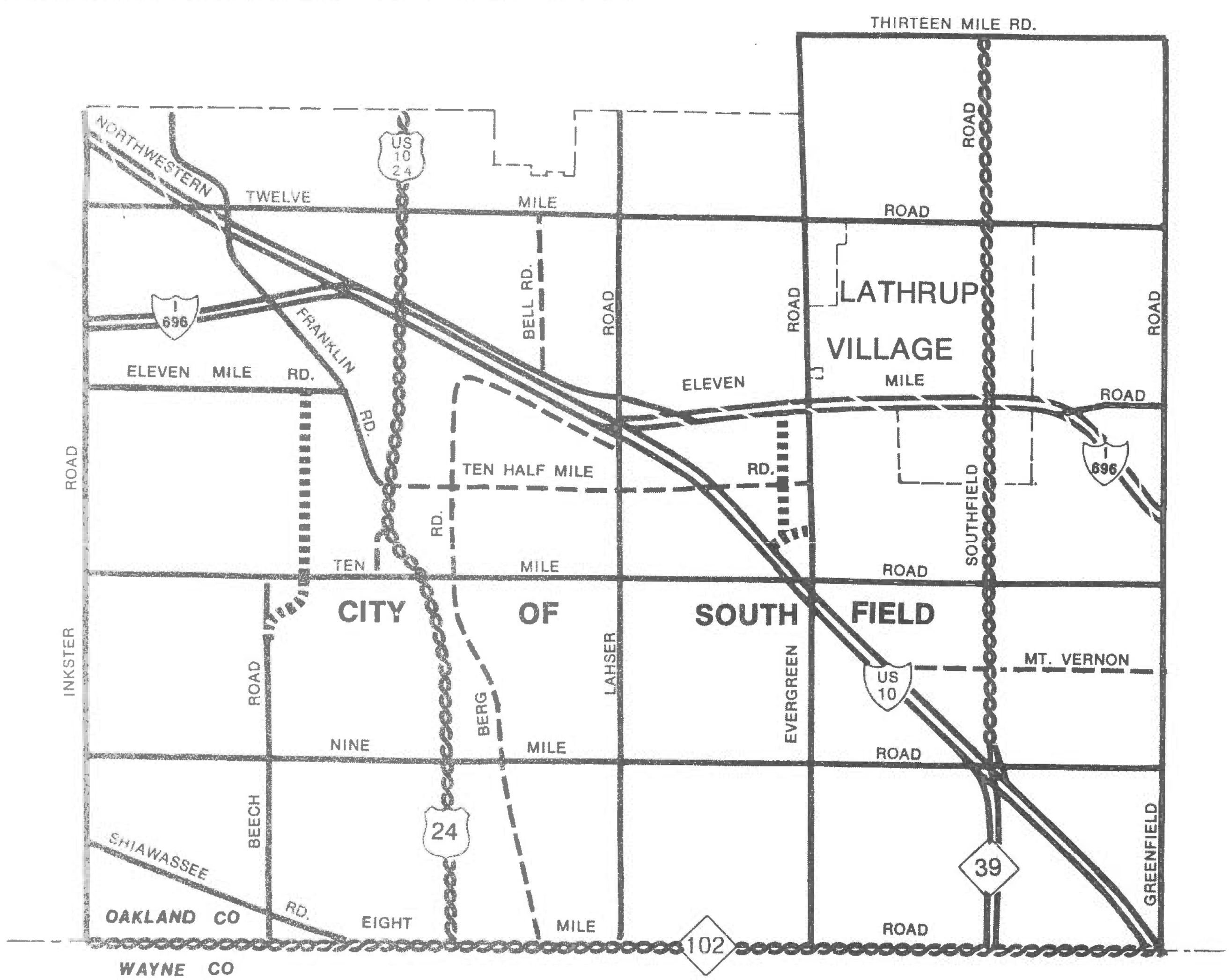
NORTH



CITY OF SOUTHFIELD

REQUIREMENTS





LYO

RIGHT OF WAY REQUIREMENTS

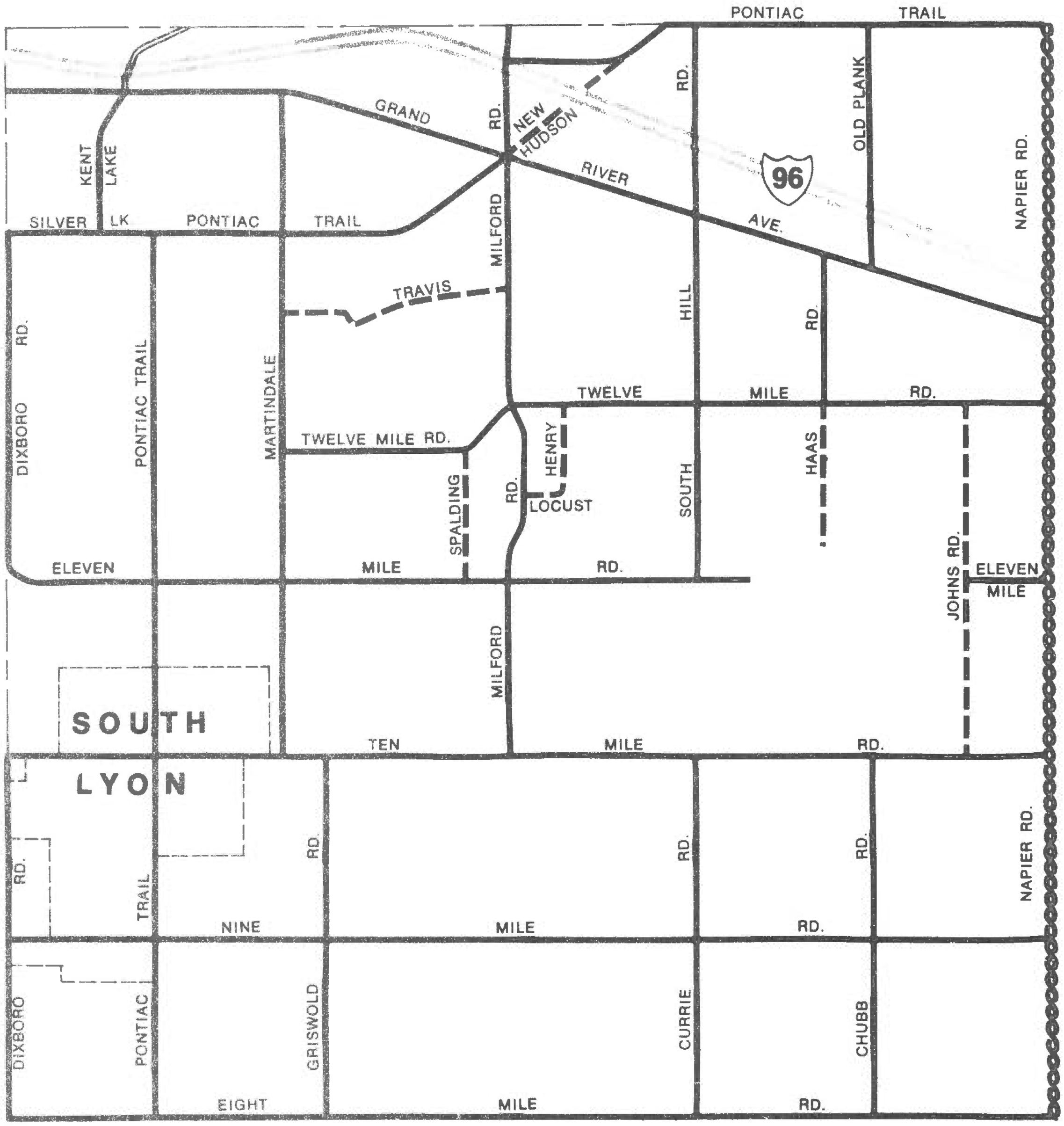
Legend

RIGHTS-OF-WAY

- 250 FOOT OR MORE **FREEWAY**
- 204 FOOT **SUPER - HIGHWAY**
- 120 FOOT **THOROUGHFARE**
- 86 FOOT **COLLECTOR**
- EXCEPTED

NOTE: Rights-of-way in color are those of cooperating agencies other than the Oakland County Road Commission. Incorporated areas are tinted.

NORTH



Prepared by the Oakland County Road Commission in cooperation with the Inter-County Highway Commission of Southeastern Michigan

TRANSPORTATION

LAND TRANSPORTATION

Planning for the year 2000 has to be based on current forecasts concerning the new ground transportation means which will be implemented by that year. One of the weak points of present transportation planning is that it is based on existing transportation technology. Studies are made and plans are prepared on the basis of today's vehicles, speeds and capacities. It has long been apparent, however, that the present modes of travel cannot properly serve current and future transportation needs.

The present state and the continuous advance of technology make it possible to develop and implement new, more effective means of ground transport. Planning at the national, regional and metropolitan levels, however, has not yet reached any conclusions on what the desirable characteristics of the new transportation system should be, how it could be integrated in the whole development, where it is needed, what its effect will be, etc.

The UDA Research Project recognized at its inception in 1965 that long-term planning should try to predict future changes in transportation systems and should investigate the best way of using them to direct future development. On the basis of the information available at that time on new transportation technology, an attempt was made to identify various desirable and technologically feasible transportation systems, and to test and evaluate them. The resulting balanced transportation system, devised to serve the movement expected for the year 2000, was incorporated in the selected Alternative 120.

During the last years there has been considerable research in the United States and abroad in future transportation technology. The most systematic study was initiated in 1966 by the Secretary of Housing and Urban Development in accordance with the federal Urban Mass Transportation Act of 1964.[1]

In the UDA Research Project no attempt was made to select and describe specific concepts and technologies for future transportation means. Instead, an effort was made to define the various levels of the future transportation hierarchy and the desirable characteristics of the transportation system which will serve each of the above levels. The studies directed by HUD, however, covered in addition the aspect of future technology and based their assumptions on more specific definitions of future transportation systems and of their performance characteristics.

Although the approach was different, the two efforts agree on all major points and are very close in most of the more detailed assumptions and findings. The major conclusions deriving from the comparison, summarized in the following pages, have been used to determine the final forecasts concerning the UDA transportation systems of the future.

The Need for and Feasibility of New Transportation Means

The major conclusion deriving from these studies is that new transportation means are necessary as well as technically and economically feasible for all levels of the transportation hierarchy. According to the conclusions of the HUD studies: "Even with engineering improvements and optimal management and utilization, present modes of urban transportation are inadequate to meet total future urban needs."[2]

A one-year research study by the Stanford Research Institute on the operations, technology and economics of future urban transportation systems concluded that "... the prospects are highly encouraging that the development and use of new systems will provide breakthroughs in urban transportation service. Certain useful new systems based on advanced technology and operating concepts can surely be developed—the evidence now available, while tentative, strongly suggests that the benefits from the use of such systems would amply justify the cost of their development, installation, and operation."[3]

---

[1] *The Urban Mass Transportation Act of 1964*, section 6(b), as amended.

[2] U.S. Department of Housing and Urban Development, Office of Metropolitan Development, *Tomorrow's Transportation*, Washington, D.C., 1968, p. 27.

[3] Stanford Research Institute, *Future Urban Transportation Systems: Descriptions, Evaluations, and Programs*, Final Report 1, prepared for the U.S. Department of Housing and Urban Development, Washington, D.C. March 1968, p. 7.

Hierarchy of Transportation Systems

Most of the classifications of the transportation systems adopted in the various studies consider a hierarchy in the transportation facilities similar to that accepted in Volume 2 of the UDA Project. The functional classification finally accepted differs from the one presented in Volume 2 only in that it considers a further breakdown of the category of urban systems into center and local systems, as these are adopted in the HUD studies:[1]

- *Center systems:* For travel within high-density multi-purpose centers such as airports, universities, shopping centers and major business districts. They will be able to handle a large number of short trips concentrated in a relatively small area. Capacity and not speed is therefore important for these systems.
- *Community or local systems:* For travel within communities or groups of communities constituting major, somewhat self-contained parts of a metropolitan area. Trips to be served by local systems are very large in number, with scattered origins and destinations. If, in order to simplify matters, they are defined as all the trips of less than 3 miles, roughly half of all the trips of a metropolitan area will fall into this category. With portions of longer trips included—the collection and distribution part of trips to be served by metropolitan and regional systems—virtually all travel could be served by local systems.
- *Metropolitan systems:* For travel within and across the relatively compactly developed portions of a metropolitan area. They will accommodate long trips, 3–25 miles, generated by moderate to high densities of development.
- *Regional systems:* For high-speed long trips, 25–150 miles, linking major regional centers— entertainment, cultural, health, etc.—airports and outlying communities. In large metropolitan areas the regional system will also serve long trips within these areas.
- *National systems:* For long-distance intercity travel along a few selected corridors of national importance. The location of these facilities is defined on the basis of broad national criteria.

New Transportation Concepts and Technology

Many different individuals, firms and public agencies have worked and are working on the development of new concepts and new technologies for future transportation means. However, review and assessment of several dozen of the most promising of these concepts have revealed that the great majority have not been fully worked out even on paper.[2]

As a result of their study of solutions which might be developed within a period of 5 to 15 years, Stanford Research Institute arrived at the conclusion that "... a single, all-purpose urban transportation system, capable of satisfying all needs for all urban dwellers, is not expected to emerge within the foreseeable future, if ever."[3] In any case, it will not emerge within the time-frame used for the UDA study. Instead, different complementary means will be needed, each one serving the specific needs of the corresponding class of the transportation hierarchy.

Following a review of new transportation-system concepts which have a reasonable probability of being operational within the next fifteen years, those which better fulfill the specific requirements of each class of the transportation hierarchy were selected.

New Transportation Means for the Five Classes of the Transportation Hierarchy

The Dual-Mode Vehicle

The dual-mode vehicle concept is the result of an attempt to combine the flexibility and privacy of the automobile with the speed, safety and comfort of automatic control. On city streets these vehicles can be used much like conventional automobiles, but they can also travel under automatic control on special guideways, either on their own suspension systems, dual-mode vehicles, or supported by special carriers, dual-mode transporters.

In American cities the greatest amount of growth is in the suburbs. As a result, the percentage of trips with an origin and destination in a concentrated downtown area is declining, and the number of trips between low-density residential areas and decentralized industrial and commercial areas is growing. Detroit is a typical example of this. In fact, the percentage of trips in its urbanized area with an origin and destination in the Detroit CBD declined from 5.4 percent in 1953[4] to 4.4 percent in 1965.[5]

[1]Barton-Aschman Associates, Inc., *Guidelines for New Systems of Urban Transportation*, Vol. 1, "Urban Needs and Potentials," U.S. Dept. of HUD, Washington, D.C., 1968.

[2]Stanford Research Institute, *Future Urban Transportation Systems: Technological Assessment*, U.S. Dept. of HUD, Washington, D.C., Memorandum Report No. 2, May 1967, p. 105.

[3]Stanford Research Institute, *Future Urban Transportation Systems: Descriptions, Evaluations, and Programs*, p. 7.

[4]Michigan State Highway Department, et al., *op. cit.*

[5]Southeast Michigan Council of Governments (SEMCOG), through its special project, the Detroit Regional Transportation and Land Use Study (TALUS), *Growth, Change, and a Choice for 1990: Preliminary Plan, Southeast Michigan*, Volume 2, August 1969.

At present, the only mode which effectively meets the travel requirements for such a situation is the freeway-automobile mode which provides for high-speed travel on freeway segments and a practical means of gaining access to these segments. Of the many new transportation systems examined, only the dual-mode concept provides similar service with additional advantages. It seems, therefore, to be the most appropriate to cover both the metropolitan and the local levels of the transportation hierarchy.

A typical example of the dual-mode vehicle is the "urbmobile," a design concept which originated at Cornell Aeronautical Laboratories.[1] This is a small 4-passenger vehicle which can operate on streets and highways, as do conventional automobiles, drawing its power from an internally stored energy source (battery). The urbmobile can also operate on an exclusive guideway, at which time it is under fully automatic control drawing its power from a third rail. The guideway system has the potential of carrying 10,000 or more urbmobiles per lane per hour, five times the number of automobiles carried per lane per hour on urban freeways.

The dual-mode concept can be developed in two main stages. In the first stage small and large automatic vehicles will move only on the high-speed guideway, at much higher speeds, however, than those currently used on the metropolitan systems, and, what is more important, without obligatory intermediate stops. Later, when control techniques are adequately developed, the above system will grow into a dual-mode system where both public and private, large and small vehicles will operate automatically on the guideway and manually on urban streets. Under this form the system will provide:

- Door-to-door service for car owners.
- Door-to-door service for drivers who do not own a car but can rent one either for a single trip or for more extensive periods.
- Station-to-station service for non-drivers. This service may be improved through the use of mini-buses which will move automatically on the guideway and manually on the streets.
- Similar service for light package delivery trucks and mail trucks.

Some of the advantages of the dual-mode system are:

- It requires much less right-of-way. An entire 2-way urbmobile guideway right-of-way will be 25 feet wide, consisting of two 8-foot lanes for urbmobile tracks and rails and a 9-foot center lane for emergency and service vehicles. Such a configuration will have a capacity 2–3 times greater than a four-lane freeway requiring an absolute minimum right-of-way of 100 feet and a desirable one of 300 feet.
- The electric propulsion system and high capacity of a guideway lane make it economically feasible to consider subsurface construction.
- Parking can be remote. Vehicles can be routed automatically to parking garages located in an area where the cost of land is low.
- Travelers are relieved of the burden of vehicle operation on the guideway segment of the journey.
- Transit service automatically follows private service, ensuring ready access by both modes in all areas of the city.
- It provides high-quality public transportation services with the most promise for the resolution of the present mobility gap between users of public and private transportation.

A dial-a-bus system activated on demand by the potential passengers can improve collection-distribution service on the local level, especially for non-drivers. The buses of this system can use the automated guideways of the dual-mode system.

Conveyors or Continuous-Flow Small Automatic Vehicles

Two typical examples of possible transportation concepts for center systems are given in a study by the Stanford Research Institute.[2] Both provide for closely spaced routes and stations at intervals of 500 to 1,000 feet, usually within a 1–3-minute walk of the traveler's origin or destination.

The first concept consists of main-line conveyors with speeds varying from 15 miles per hour down to 1.5 miles per hour, and station conveyors with constant speeds of 1.5 miles per hour. The second concept is based on lightweight 3-passenger vehicles operating under automatic control on special guideways. The vehicles will move continuously at speeds of about 15 miles per hour, except when entering or leaving stations. The 15-miles-per-hour maximum speeds of the two systems will result in effective speeds within a range of 8–12 miles per hour.

The capacity of the first system, as envisioned, depends on the width of the belts employed. However, a 4-foot main belt, considered the minimum width acceptable for safety reasons, would have a capacity of almost 8,000 passengers per hour. The second system,

[1]Cornell Aeronautical Laboratories, Inc., *Bi-modal Urban Transportation System Study*, Vol. 1, Final Report, U.S. Dept. of HUD, Washington, March 1968.

[2]Stanford Research Institute, *Future Urban Transportation Systems: Descriptions, Evaluations, and Programs.*

as envisioned, would only accommodate about 2,000 to 2,500 passengers per hour on each line, but the effective capacity could be increased to any desired level by providing additional lines.

In addition, an extension of the dual-mode system operating under reduced speeds and with more densely spaced stations might offer another alternative for the development of center systems.

High-Speed Ground Transport

At the regional and national level, high-speed ground transport, like the French Aerotrain now in experimental operation, can be used up to certain cruising speeds, e.g., 200 miles per hour, while for higher speeds, systems which employ enclosed tubes are appropriate. The former presents the advantages of being already in the implementation stage, while the latter can better satisfy the high-speed requirements of long-distance travel.

The Aerotrain, a wheelless, high-speed train traveling on an air-cushion, was first put into experimental operation in 1965, and reached a top speed of 215 miles per hour in 1967. The first regular service in France is scheduled to begin in 1972, linking Paris and Orleans.

The Gravity Vacuum Transit (GVT) is an example of the pneumatic tube system. The tube, in which the vehicles would operate in a partial vacuum, would dip between stations so that gravity would accelerate the vehicles at high rates with no discomfort to passengers.

Station spacings of 4–8 miles appear to offer attractive combinations of speed and service for the high-speed ground-transport means. Capacities as high as those achieved on rail transit lines, 30,000–40,000 passengers per hour, are possible.

The Improved Automobile for All Levels of the Transportation Hierarchy

The conventional automobile, in an improved form, expected to play an important role in all five levels of the transportation hierarchy. The introduction of the new system described above will alleviate freeway and street congestion, allowing automobiles to make full use of their unquestionable advantages in door-to-door service. As already mentioned, the dual-mode vehicles will constitute another type of small automobile which, under manual control, will have characteristics similar to those of conventional automobiles. At a later stage the dual-mode vehicle and the conventional automobile may be combined to form a single type of automobile of varying sizes, capable of operating under both manual and automatic control.

Speeds

In the local and center systems, speeds similar to the off-peak speeds of today are expected. This is in accordance with the assumption made in Volume 2 concerning the urban transportation system which encompasses the above two systems.

Speeds of 50–80 miles per hour for the dual-mode vehicles when operating under automatic control are foreseen by the developers of such systems. Speeds of 50 and 70 miles per hour were considered in the Stanford Research Institute studies.[1] The preliminary analysis in these studies showed that the latter speed is more advantageous and suggested that systems with speeds even higher than 70 miles per hour may be desirable. The 100 miles per hour speed accepted in Volume 2 for the year 2000 metropolitan network of the Alternative 120 may, therefore, be considered to be in agreement with the above figures, which refer to transportation concepts to be developed within the next 5–15 years.

The most pronounced difference between the Stanford Research Institute studies and the UDA study exists in the speeds of the regional system. The former suggests alternative cruising speeds of 160 and 250 miles per hour which, however, drop to 110 miles per hour and 140 miles per hour, respectively, if an average of 6-mile spacing of stations is considered.[2] In the UDA study a 250-miles-per-hour cruising speed was also accepted but it was assumed that at this speed capsule transfers may be feasible,[3] and therefore, no reduction of speed was accepted for stopping at stations. Such an assumption can be justified by the fact that a period of more than 30 years is considered, as compared with the 5–15 year period of the Stanford Research Institute study.

Configuration and Spacing

The advantage of a gridiron configuration for the metropolitan system was recognized in the Stanford Research Institute studies and a grid-like, area-wide network was accepted with guideway and station spacing every ½ to 3 miles.[4] This conforms to the UDA assumptions in which an average theoretical guideway spacing of 6 miles, with entrance and exits every 2 miles, was originally accepted. These spacings were considerably decreased in the denser areas, following the com-

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[1] *Ibid.*

[2] *Ibid.*

[3] Massachusetts Institute of Technology, *Survey of Technology for High Speed Ground Transport*, Part I, U.S. Dept. of HUD, Washington, 1965.

[4] Stanford Research Institute, *Future Urban Transportation Systems: Descriptions, Evaluations, and Programs.*

putation of person flows through the transportation model.

In general, regional systems will be developed along corridors of heavy volume, long-distance movements and, therefore, a regular gridiron configuration cannot be imposed without regard to the existing and planned development. In the special case of UDA, however, the assumed gridiron configuration of the regional network and the average spacing of 18 miles between facilities of this network fit the existing arrangement of functions generating regional travel. Also, when the urbanized areas grow and the regional facilities more and more serve long intracity trips, their regular spacing will better comply with their role as a higher order metropolitan system. The average station spacings for regional facilities are the same for both Stanford Research Institute (4–8 miles) and UDA (6 miles) systems.

Capital Costs

Although a direct cost comparison is difficult because of the different assumptions concerning the extent, form, capacity, etc., of the systems, a rough comparison shows that UDA estimates are close to the detailed estimates made in various other case studies. In fact, the capital costs of a route mile of a dual-mode system were estimated to range between $5.1 million and $6.3 million in a case study for southwest Minneapolis,[1] and between $5.7 million and $6.3 million, or $13.8 million if entirely underground, in a Buffalo case study.[2] In the UDA project the cost of a two-way metropolitan facility with comparable capacity—25,000 persons per hour—was estimated to be $6.3 million per mile (see Volume 2, page 285).

The cost of a regional system with one line in each direction, having a total capacity of 600,000 passengers per day, was estimated to be $16 million per mile for UDA (Volume 2, page 286). The cost of a gravity vacuum transit system in a case study for the San Francisco Peninsula[3] was estimated to be $10 million per mile. The higher figure of the UDA assumption is justified because it is based on a more expensive type of facility, with at-speed capsule transfers, higher average speeds, etc.

Evolution of New Transportation Means

The Stanford Research Institute has tentatively assumed[4] that 8–13 years will be required to certify the various new means of transportation for public use. Similar periods of development are suggested by other studies. On the other hand, the less sophisticated forms of new means are expected to start operation at a much earlier date; for instance, the first regular service of the Aerotrain in France linking Paris to Orleans is due to commence in 1972.

In view of this, it seems reasonable to assume that new transportation means could start being implemented by 1980. This, however, does not mean that the present transportation systems should not continue to be developed to cope with the increasing demand up to the time the new means begin operation and become able to serve a substantial amount of travel. Nor does it mean that they should be abandoned after that time. The automobile in particular, in a form similar to its present one, will most probably continue to play a leading role in transportation for many more years.

AIR TRANSPORTATION

The analysis presented in Volume 2 indicated the need for a new major airport before the year 2000, considering the forecasts of enplaned passengers and aircraft operations in relation to future capacity of facilities provided in major UDA airports.

The subject was reviewed with various technical groups so that the study might benefit from expert opinion and take advantage of the latest developments in air transport technology.

Recent developments in air transportation confirm the need for a new major airport in UDA before the year 2000. It is expected that this need will be felt even if urban development in the area is left to follow its own course. The proposed development north and northeast of Detroit may, in fact, intensify this need much sooner, possibly in the late 1980s or early 1990s.

According to present forecasts by the Federal Aviation Agency, enplaned passengers in UDA are expected to quadruple between 1965 and 1980, while aircraft operations will roughly triple. The increasing size of transport aircraft is expected to reduce peak hour aircraft operations to within the capacities of the present or an improved Detroit Metropolitan Airport, which will have at least one additional runway and new terminal buildings to handle the fourfold increase of passengers by 1980. After 1980 and before the turn of the century, continued growth of air carrier operations will require a second domestic air carrier airport.

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[1] *Ibid.*

[2] Cornell Aeronautical Laboratories, *Bi-modal Urban Transportation System Study.*

[3] Stanford Research Institute, *Future Urban Transportation Systems: Descriptions, Evaluations, and Programs.*

[4] *Ibid.*, p. 32.

In addition, the projections for increased general aviation activity indicate the need for additional general aviation airports and facilities to complement scheduled air carrier requirements.

New technological development, however, may create new needs well before 1980. The development of supersonic travel is expected to generate needs for new aviation facilities with international or even national connections. Such developments raise the possibility of creating an international gateway in the midwest by providing an international supersonic airport for UDA and its surrounding region. UDA appears suitably located for such a major airport facility because it is at the geographic center of the Great Lakes megalopolis, has extensive access to the lakes, and is close to Canada.

Several metroports may be required throughout UDA for trips of less than 500 miles either to final destinations or to airports where passengers can board jet transports for long trips, unless the development of high-speed ground transportation makes many of these shorter flights unnecessary.

WATER TRANSPORTATION

The previous studies presented in Volume 2 also indicated the need for a new major port complex in UDA. This conclusion was derived from general forecasts of waterborne commerce in UDA and the future handling capacity of the ports of Detroit and Toledo. This subject also was reviewed with various technical groups, and expert opinions on the latest developments in marine transport technology were made available.

The conclusions of such studies have shown that the future of waterborne bulk cargo remains uncertain due to increasing competition from railways (coal by unit rail), and from energy-resource substitution (petroleum and atomic energy instead of coal). Moreover, bulk cargo is usually handled by private carriers at private terminals which are selected and designed to meet the particular needs of ships using them, and which are paid for privately.

On the basis of the above considerations, it becomes apparent, therefore, that provision for a new major port facility in UDA could not be based on the needs of future waterborne bulk cargo alone. Waterborne general cargo is exclusively limited to overseas trade, and it is tending to become containerized. By 1980 it is expected that 80 percent of general cargo will be containerized. Increased competition from inland containerized carriers is anticipated, however. In fact, some pessimistic studies predict the diversion of all general cargo from the lakes by fast container trains to seaboard ports by 1985.

Although future Seaway plans could meet the navigation requirements of large containerized ocean-going ships of up to 32-foot draft, considerable dredging would be required in the Great Lakes to make lake ports accessible. Such difficulties may be overcome by a feeder and transshipment system. Containerized lake carriers of conventional dimensions could run a shuttle service between a central lakes port and a seaway port (Montreal), where the containers or containerized barges could be transshipped into regular ocean-going container lines.

Based on the volume of future containerizable general cargo in the Great Lakes, at least one container terminal could be supported. Thus, if navigation problems in the Great Lakes are solved, a container terminal in UDA might have to serve regional waterborne requirements of the Detroit–Toledo–Cleveland area. In any case, the development of secondary feeder ports at existing and new locations in UDA should also be envisaged.

Structure and Function

GENERAL

In order to proceed with the elaboration of the various elements of the concept-plan, the general framework of the future physical structure of UDA must be outlined on the basis of the broad guidelines derived from the selected alternative.

On the basis of this general framework, a detailed distribution must be made for the various functions throughout the study area. Thus the structure and functioning of the future land transportation network must be defined in the greatest possible detail, and the location and connections of the future airport and port facilities must be decided. Following this, the distribution of the future centers of employment, including centers of services and industry, should be determined for the various units of study. Moreover, the distribution and type of the future residential and recreational areas should be defined.

The results of this elaboration are finally used for the detailed distribution of population and movements throughout the study area. These distributions, which are made for study units of 6 by 6 miles, are determined through the use of population distribution and transportation models described in this chapter.

THE BASIC FRAMEWORK OF PHYSICAL STRUCTURE

A concept-plan for UDA, which attempts to express in physical terms the targets set for the future by the selected alternative, should recognize two major elements. The first is related to the natural and geographic setting of the study area, and the second to the overall existing and potential development of the wider region of which the study area is a part. The future physical structure of UDA is in fact determined by a number of major requirements deriving from these two elements.

In the context of the natural environment the most decisive element is obviously the overall configuration of the area as defined by the existence of the larger water bodies, which make it possible for only certain sections of the United States portion of UDA to have immediate land connections with Canada.

A major element of attraction for urban development is water and, therefore, the concept-plan for the future UDA should provide for the maximum utilization of waterfront sections. Actually, this requirement has already been taken into account by the selected alternative which proposes a new urban center in St. Clair County along the St. Clair River. Alternative 120 is based on the recognition of the importance of those sections of UDA which present the double advantage of being along the water and, at the same time, of having easy land communications with Canada. Development of the new twin urban center in one of these sections along the St. Clair River will actually duplicate the historical development of Detroit itself. Detroit's location utilized the great advantage of a position on the Detroit River where connection with Canada was possible and easy.

In regard to the second major element, it is imperative that the basic structure of the UDA concept-plan promote and emphasize the central location of UDA within the wider megalopolitan space. This will be achieved mainly by ensuring the best possible functional connections of UDA with the wider area and particularly with the existing and emerging megalopolitan formations in the Great Lakes area (Figs. 276–277).

The study of the existing physical structure of the wider region shows clearly that, at present, there is only one megalopolitan corridor from the west: Chicago–Kalamazoo–Jackson–Detroit (Fig. 276). This corridor splits at Detroit, with one section going northeast toward Canada and the other taking a north-south direction toward Toledo, Cleveland and Pittsburgh. It is also clear that west of Detroit the other urban settlements in the southern part of Michigan—Flint, Lansing, Saginaw, Bay City, Grand Rapids, Muskegon, etc.—can only be considered "local" since they are along local axes radiating from Detroit. Thus there are two local corridor formations: Detroit–Lansing–Grand Rapids–Muskegon and Detroit–Flint–Saginaw–Bay City.

It is now both necessary and possible to change the present system. This necessity was understood with the realization that the potential for megalopolitan development to the west of Detroit covers a much wider zone than that of the present megalopolitan corridor (Fig. 277). Indeed, as the studies of the Great Lakes megalopolis have emphasized, the zone of potential development includes the whole of the Michigan peninsula south of the parallel at Saginaw Bay. A transformation of the present system could make this wide zone a functional part of the megalopolitan development and by doing so emphasize UDA's central location in the emerging Great Lakes megalopolis.

With the concepts of the new major urban concentration in St. Clair County, the new east-west high-speed land transportation axis and the reinforcement of the southern east-west axis at Toledo, a new system can be created. Thus, instead of one megalopolitan axis and a few "local" ones in southern Michigan, the new system covers a much wider zone with three basic transportation lines running east-west, at the two edges and in the middle of the zone. The northernmost axis now becomes megalopolitan in nature, and probably more important than the middle axis. Together with the new major urban concentration in St. Clair County proposed by the selected alternative, this northernmost axis, through the high-speed international transportation facility, unifies as well as delocalizes and regionalizes a significant number of important urban settlements in Michigan: Flint, the Saginaw–Bay City complex, Lansing, Grand Rapids and Muskegon.

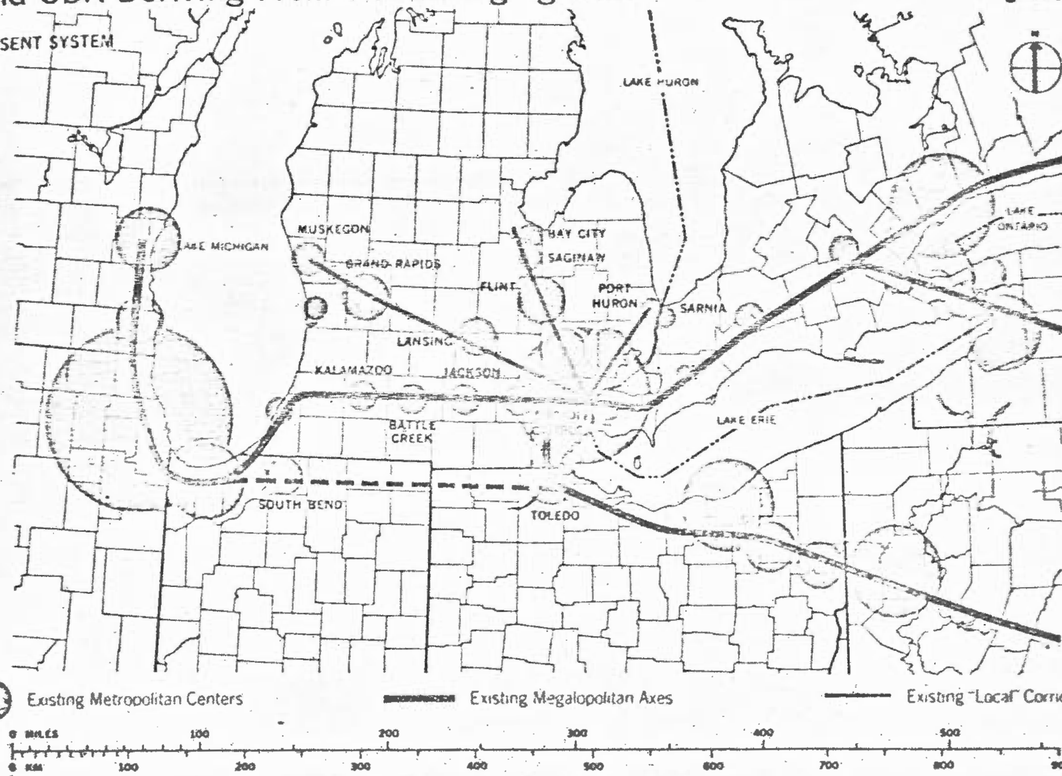
Therefore, instead of one east-west megalopolitan corridor which passes through and east of Detroit and then splits in two, there will be three corridors with the new system: two corridors along the sides of Detroit and a third across the middle of it. The two northern-most of these three megalopolitan axes are the most urbanized. The southernmost axis is at the edges of the wide urbanized zone, and the least urbanized of the three.

The above considerations provide the basic framework within which the broad lines of the physical plan for the development of UDA are conceived (Fig. 278). The fundamental implications of such a framework can be expressed as follows:

The New Physical Structure For Southern Michigan And UDA Deriving From The Emerging GLM

Fig. 276

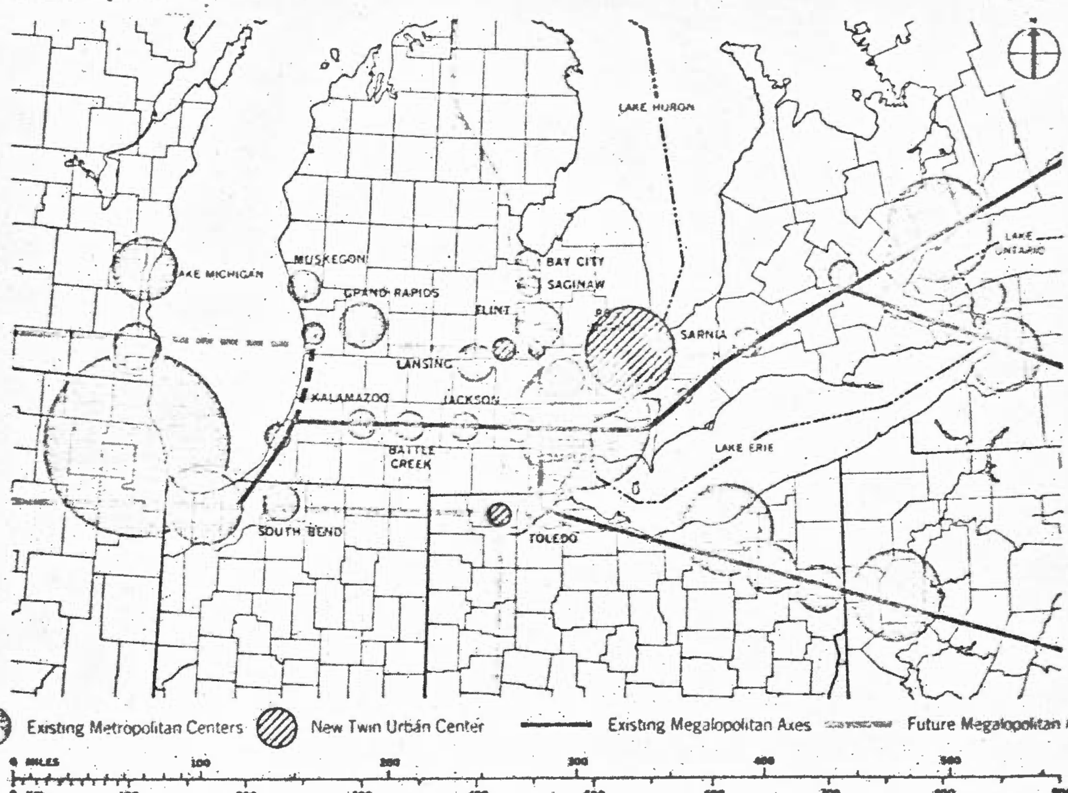
PRESENT SYSTEM



Existing Metropolitan Centers — Existing Megalopolitan Axes — Existing "Local" Corridors

NEW SYSTEM REQUIRED

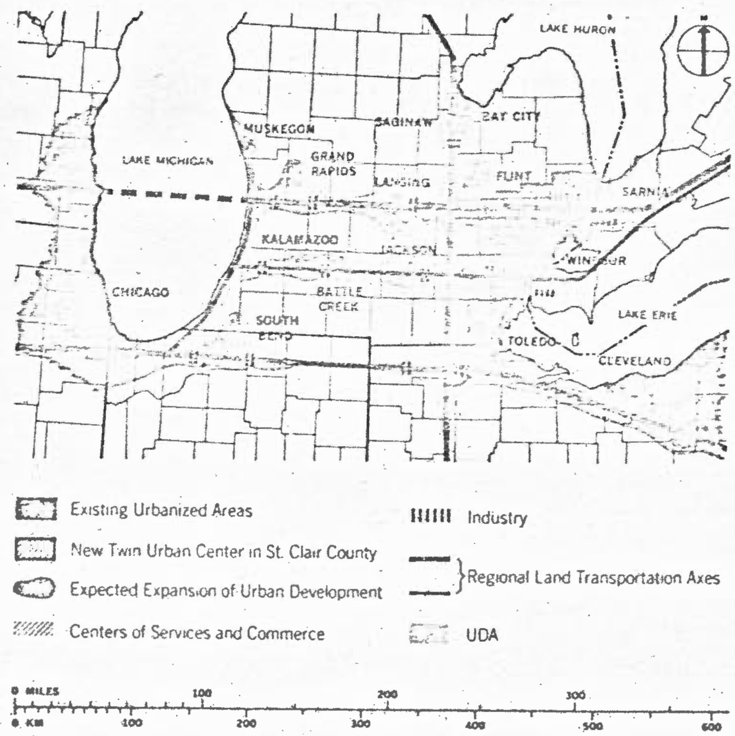
Fig. 277



Existing Metropolitan Centers — New Twin Urban Center — Existing Megalopolitan Axes — Future Megalopolitan Axes

Fig. 278

The Development Concept For Southern Michigan And UDA Deriving From The Emerging GLM



- As far as the east-west direction is concerned, three basic lines constitute the backbone of the physical plan.
- These three axes, particularly the two northernmost ones due to the numerous and important urban concentrations they are destined to serve, are conceived as the carriers of important functions located along sections of their length. The creation of new centers of services, commerce and industry is proposed on these axes as twin poles of attraction for the existing metropolitan centers located close to their alignment.
- The northernmost east-west axis becomes particularly important. The physical structure of the new twin urban center in St. Clair County is greatly affected by this axis. First, the form of the main portion of this twin urban center basically follows its direction. Second, the central functions of higher order and, more specifically, the CBD of this new twin urban center are conceived as running from the lakeshore along this axis. New secondary centers are located on the same axis while industry is conceived as extending in corridor formations in the same direction.
- Along the north-south direction, taking into consideration the new urban concentration in St. Clair County, another line becomes very important. This line runs along the lakeshore and connects the new twin urban center with Detroit and Toledo.
- Another axis is proposed in the north-south direction passing west of Detroit. This axis, national in character, is conceived as connecting UDA with Michigan and Canada to the north, and with a series of important urban concentrations as far away as Florida. Although of lesser importance than the east-west axes, this axis is destined to carry, along its length within UDA, significant functions as well as new urban centers, and it can be the answer to the problem of tying the Michigan Upper Peninsula and the northwestern part of the Lower Peninsula to Detroit.

TRANSPORTATION

LAND TRANSPORTATION

The analysis of recent studies in new transportation systems, summarized in the preceding chapter, justifies the assumption that new means of transport will start being used to a considerable extent around 1985. The interim period will be spent in the development and testing of prototypes and in their implementation in those cases where particularly favorable conditions prevail.

A conclusion derived from this assumption is that the conventional transportation systems will continue to be developed and expanded up to the year 1985 when they will reach peak usage. The period 1985–2000 will be transitional during which new transportation means will be gradually developed, operating in parallel with the conventional systems. During this period no substantial expansion of the conventional systems is expected to take place as the new means will increase the capacity of the overall system at a higher rate than that needed to serve the increase in the movements of people and goods. Beyond the year 2000 the conventional systems are expected to serve decreasing portions of the total movements until they are fully replaced by the new means.

In accordance with these conclusions, the land transportation system proposed for UDA in the year 2000 is composed of properly interconnected facilities serving both conventional and new transportation means. The conventional network serves the entire UDA and consists of road facilities covering the whole hierarchical scale from local streets to freeways. The network serving the future means covers the large urbanized areas as well as major axes linking the entire UDA. It consists of metropolitan automated guideways serving dual-mode vehicles and of regional high-speed ground transport facilities.

A traveler intending to use only the conventional car can reach any destination within UDA, traveling throughout the trip on the conventional network. A traveler intending to use the future means effectively can travel only within the urbanized areas where such means are developed and along the major axes connecting urbanized areas. A combination of the conventional and the new transportation means may provide a better choice for certain types of trips.

The Conventional System

The main conventional network of UDA tested through the transportation model includes three classes of conventional facilities (Fig. 279): freeways, expressways and rural highways, similar to the corresponding present ones, with slightly increased capacities and speeds due to the expected improvements in the conventional automobile and in the facilities themselves.

The main conventional system, as conceived in this study, represents the development of the present system by the year 1985. It is assumed that only a few additions will be made between 1985 and 2000 in order to serve the areas to be developed during that period. Therefore, the network serving the conventional means in the year 2000 will not differ substantially from that of the year 1985.

The system of urban and rural freeways tested in the transportation model consists of the existing freeways, those under construction or at the stage of final study and programmed freeways for which appropriation of right-of-way is under way. No substantial changes in the alignment of those facilities are proposed. A few additions have been made in order to provide for sufficient connections in the least served areas. Most of these additions closely follow the proposals of the Michigan State Highway Department regarding further expansion of the freeway system after 1975.

Urban expressways were provided to form, together with urban freeways, an adequately spaced metropolitan high-speed system. They incorporate the present system of major arteries.

The Future System

The main network of UDA serving the future transportation means in the year 2000 is defined on the basis of the results of the previous runs of the transportation model for Alternative 120 and should be considered as rather extensive (Fig. 280). It was prepared for a final testing through the transportation model and was then reduced to the proper extent in agreement with the results.

While the conventional transportation systems follow the present form of development more closely, the new systems are primarily associated with the future structure of the area and follow the future development patterns of UDA as envisaged by Alternative 120.

The metropolitan guideways, serving small or large dual-mode vehicles moving under automatic control, are intended to serve long intraurban trips at high speeds. They therefore fall in the category of metropolitan systems, together with the conventional urban freeways and expressways. They are built on a 6 by 6-mile basic grid. Deviations from the gridiron configuration

Fig. 279

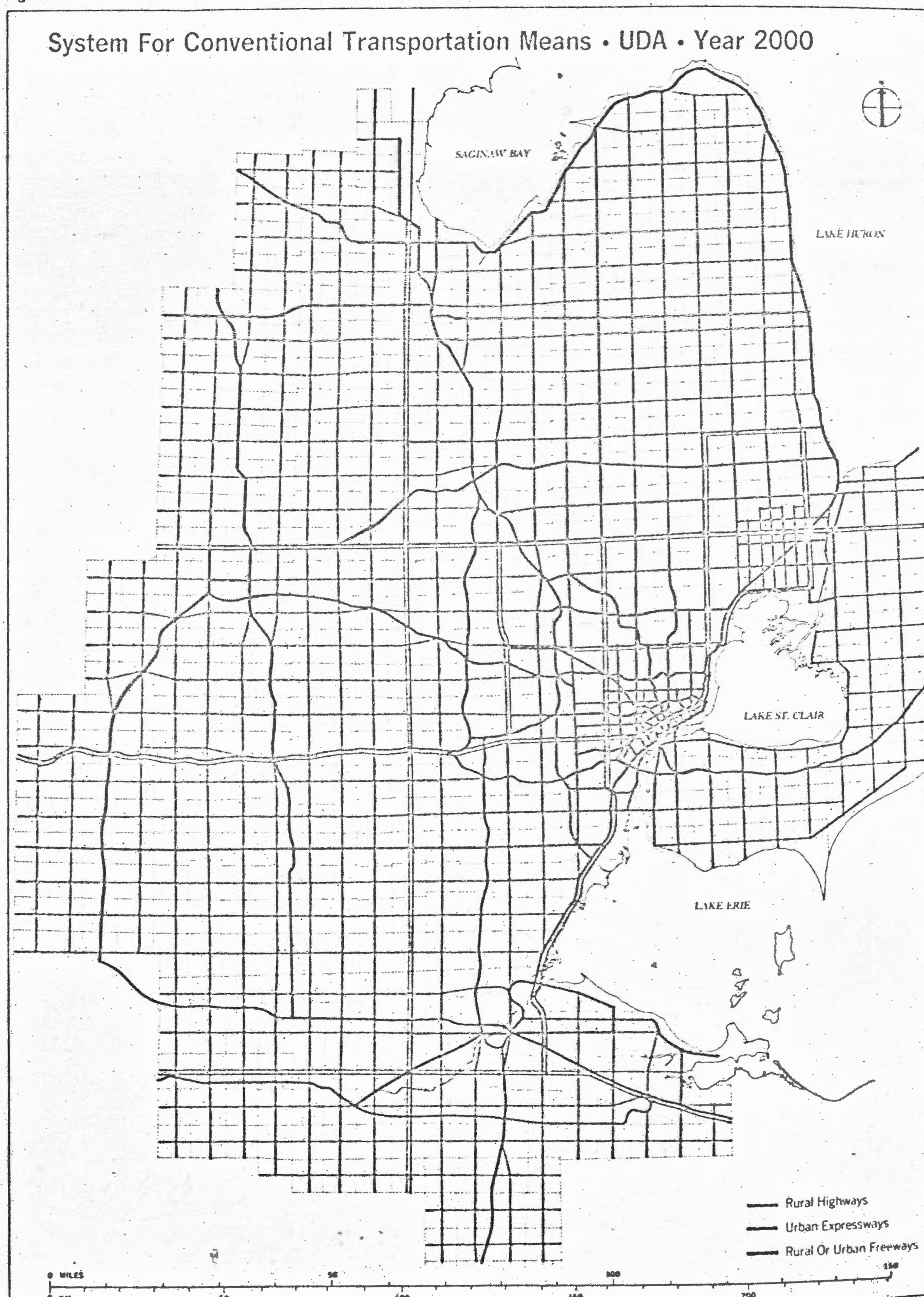
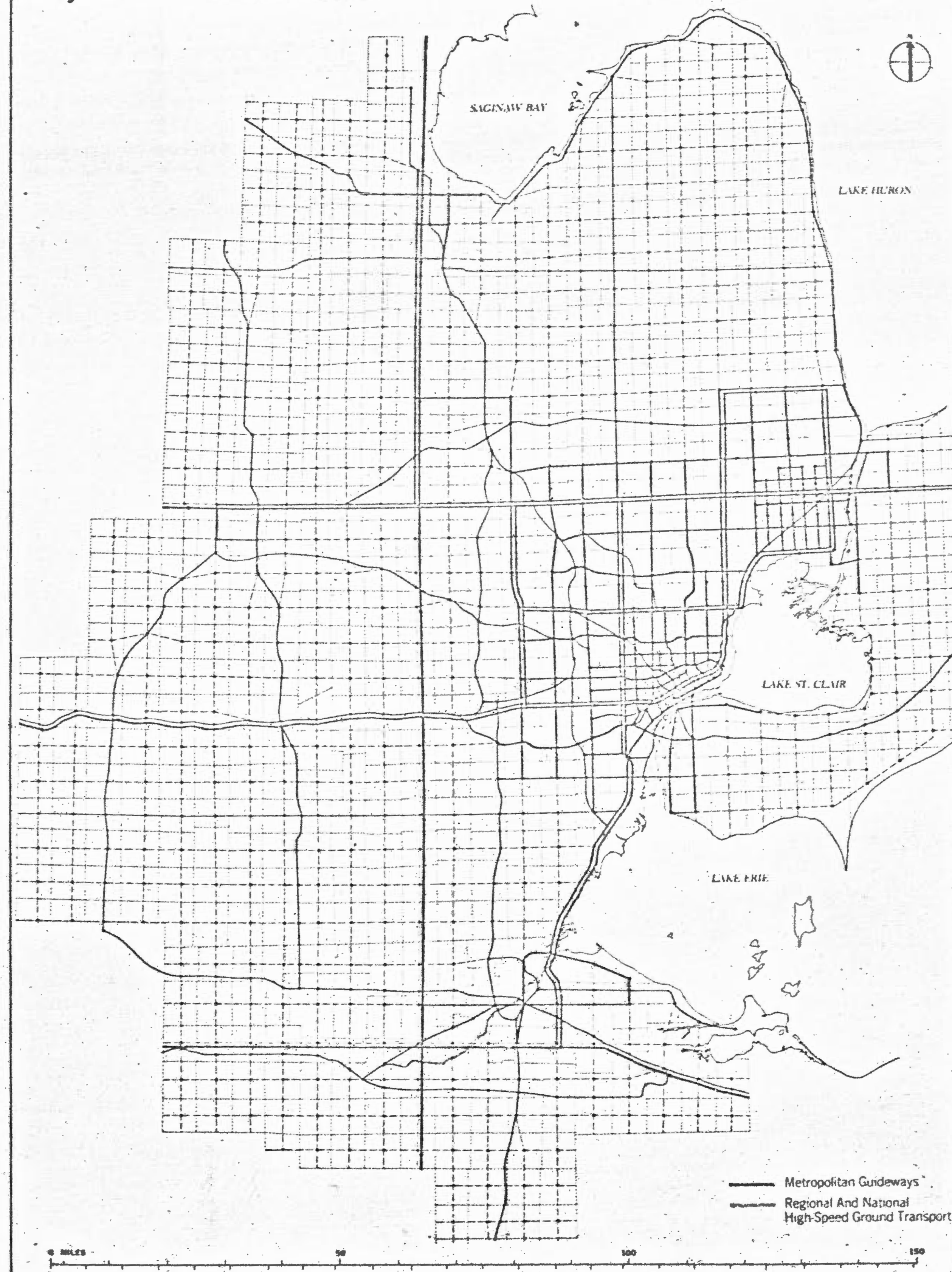

System For Conventional Transportation Means • UDA • Year 2000
SAGINAW BAY
LAKE HURON
LAKE ST. CLAIR
LAKE ERIE
Rural Highways
Urban Expressways
Rural Or Urban Freeways
0 MILES
50
100
150
0 KM
50
100
150
200

Fig. 280

System For Future Transportation Means • UDA • Year 2000



were necessary in the area of Detroit itself where alignments of existing major facilities have been followed. Closer spacings were also necessary in the central parts of the Detroit and the new twin urban center areas to achieve better service and to avoid unreasonably high person flows. These spacings were determined according to the results of the previous runs of the transportation model.

The future regional system is envisaged as a high-speed ground transport system (HSGT) basically serving the connections of urbanized areas with each other. However, it is expected that in the large metropolitan areas of Detroit and the new twin urban center the regional system may also serve long intrametropolitan trips, connecting points which are favorably located near the stations of the regional system. The system is built on an 18 by 18-mile grid: regional connections were provided through the high-speed ground transport system where justified by the previous runs of the transportation model as well as along the north-south and the two east-west national axes. These connections, regardless of the person flows they serve, are justified by applying broad interregional and national criteria.

Center systems in the year 2000 were assumed to serve the major activity areas of the CBDs of Detroit and the new twin urban center where high volumes of short local trips are expected.

The Overall System

Types of Facilities and Their Uses

The various conventional and future transportation means mentioned in the previous sections and their main uses as components of the overall land transportation system of UDA are given in Table 43.

Table 43. Types of Transportation Facilities and Their Uses, UDA, 2000

Type of facility	Description	Length of UDA networks tested (miles)	Average running speeds (mph)	Type of vehicle conventional (C) or future (F)	Use within urbanized areas	Use outside urbanized areas
Center system	High-speed conveyor belts or small automated cars at close spacing	—	12–15	F	Short trips and access in major activity centers	—
Local system	Local, collector and arterial roads similar to the present ones, serving conventional vehicles or dual-mode vehicles under manual control	—	20–25	C or F	Short trips and access	Short trips and access
Urban expressways	Similar to present ones serving conventional vehicles	1,153	45–50	C	Long high-speed trips within urbanized areas along heavily traveled major corridors	—
Urban freeways	Similar to present ones serving conventional vehicles	931	60–80	C	Long high-speed trips within urbanized areas along heavily traveled major corridors	—
Metropolitan guideways	Automated guideways where dual-mode vehicles run under automatic control without stops	1,820	70–100	F	Long high-speed trips within urbanized areas along heavily traveled major corridors	—
Rural highways	Similar to present ones serving conventional vehicles	5,576	35–40	C	—	Trips in rural areas
Rural freeways	Similar to present ones serving conventional vehicles	1,337	60–80	C	—	Trips in rural areas along main axes
Regional HSGT	High-speed ground transport	815	150–250	F	Very long trips within major metropolitan areas	Trips in rural areas along heavily traveled major corridors

Typical routes on the overall system are illustrated in a schematic way in Fig. 281. Trips originating in rural areas with destinations in urbanized areas can be made in a conventional vehicle using the conventional network throughout the trip (Fig. 281A). The section of the trip within the urbanized area can be made on the future system. In this case the traveler will leave his conventional automobile at a station of the future system and continue his trip on future transportation means until he reaches the same station again on his return trip.

Trips with both origins and destinations within the same urbanized area can be made using either the conventional or the future means throughout the trip. The possibility exists, however, of using a combination of both systems exactly as in the case of trips between a rural and an urbanized area. This combination is most probable for long trips where the use of the regional high-speed ground transport system may be attractive in spite of the inconvenience caused and the time spent in changing systems (Fig. 281B).

As a rule, trips originating in urbanized areas with destinations in rural areas will be made by conventional means (Fig. 281C). Trips by new means cannot be continued beyond the fringes of the urbanized area without a change of system since the future systems in the year 2000 will cover only the major urbanized areas and their interconnections.

There will be various possible combinations of transportation means other than the typical ones. However, these exceptions will be comparatively few in relation to the total number of trips.

Speeds

In light of the comparisons of assumptions pertaining to speed, two sets were considered for the year 2000 in the final run of the transportation model. They were meant to represent limits within which the actual speeds for the year 2000 would most probably be included. The high-speed set corresponds to the high-speed assumptions made to date for the UDA study, while the low-speed set represents more conservative views regarding the development of new transportation means and the improvement of present ones. The average running speeds of the two sets are given in Table 44.

Speeds on the higher order conventional facilities were assumed, especially in the high-speed assumption, to be higher than the present ones as a result of expected improvements in the vehicles and facilities. Furthermore, the introduction of new means will relieve the conventional system of high pressures, allowing better functioning resulting in higher speeds.

Fig. 281 Typical Routes Through Conventional And Future Transportation Means

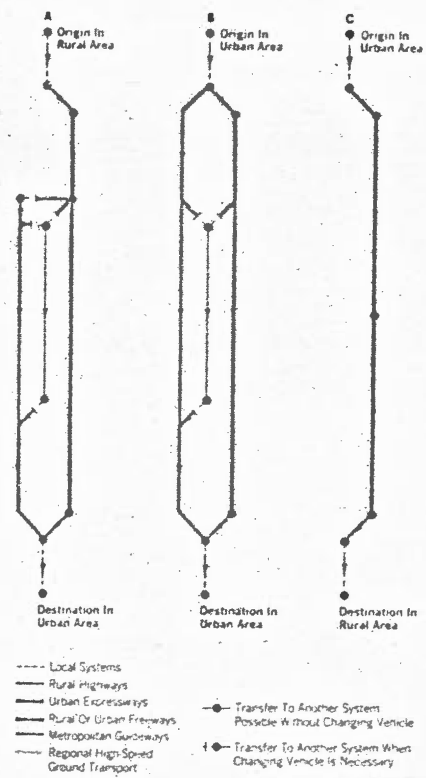


Table 44. Assumed Average Running Speeds, UDA, 2000 (miles per hour)

Type of facility	High assumption	Low assumption
Center system	15	12
Local system	25	20
Urban expressways	50	45
Urban freeways	80	60
Metropolitan guideways	100	70
Rural highways	40	35
Rural freeways	80	60
Regional-national HSGT	250[1] approx.	150[2]

Note: [1]Non-stop. Transfer at speed.
[2]Cruising speed 250 miles per hour. Average running speed depending on spacing of stations.

Transfer and Turn Times

Average running speeds do not take into account the time needed for transfer and change of direction. The respective assumptions for estimating average person delays when changing transportation systems or when changing direction or line within the same system have been computed for every combination of means and inserted in the transportation model.[1]

Time spent in transfers or changes of direction has been categorized as walking, waiting and cruising time in order to work out estimates of time costs, using different time values for each category. When computing overall travel times, walking times have been multiplied by 2 and waiting times by 2.5 to express the inconvenience involved in these cases. The above factors comply with the time value figures already used in similar studies[2] and derived from previous work.

Modal Split

For a certain trip, the potential traveler has to select the most appropriate of the various transportation means available. The choice of the conventional means, the future means or a combination of the two will be affected by various factors related to the characteristics of the trip, e.g., trip purpose, time of day, etc.; the characteristics of the traveler, e.g., income, car ownership, etc.; and the characteristics of the transportation system, e.g., travel time, travel cost, travel distance, comfort, convenience, etc.

The available statistical data and the various present modal split techniques refer to the existing conventional transportation means, comparing the private car to the public transit systems. Such data and techniques, because of changing travel habits, are of only limited assistance even in attempting to predict modal split patterns for the same means in the year 2000. They are much less useful when, as in this case, new means of transport are considered.

Any sophisticated modal split technique based on a large number of variables will have no meaning when referring to future transportation means because the actual characteristics of the means and the corresponding behavior of the travelers are extremely difficult to predict. A simplified procedure based on the most well-defined and influential modal split factor, i.e., the travel time, was developed and applied as a first approximation in allocating the total number of potential person trips to each one of the transportation systems considered.

According to the most common typical routes (Fig. 281), two basic transportation groups were considered separately in the modal split procedure:

- *Group A: Conventional transportation system plus regional and center systems.* This group serves all movements carried out through conventional vehicles, possibly in combination with the regional high-speed ground transport system or with the center system. All types of movements can be carried out through this group of transportation facilities.
- *Group B: Future transportation system plus feeder conventional system.* This group serves all movements carried out through the dual-mode vehicles, possibly in combination with the conventional system, the regional high-speed ground transport system and the center system. This group is intended to serve movements with one or both ends in urbanized areas. All trips with both ends in rural areas are assigned to Group A. Thus, routes between rural areas, using the metropolitan guideways to traverse an urban area, were excluded.

Trips between two points were assumed to be apportioned between the two groups, depending on the ratio and difference of travel times. The curves shown in Fig. 282 were developed from the presently used modal split curves[3] by making the additional assumption that if all factors influencing modal split, except those expressed by travel time, were combined, their composite effect would not have played any significant role in modal split. For this reason a 50/50 split was assumed in case of equal times.

The minimum travel paths and travel times between any two points were computed separately for the two groups and an average travel time, weighted according to the percentage distribution given by the modal split curves, was computed and used in the population distribution and trip distribution procedures. The study unit-to-study unit trips deriving therefrom have been apportioned subsequently between the two groups, following the modal split curves, and then assigned to the corresponding minimum travel time paths.

Trip Productions

The assumptions made for trip production in the whole UDA in the year 2000 are summarized in Table 45 where the corresponding figures deriving from the transportation surveys conducted in 1953 and 1965 for the Detroit area are also shown.

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[1] "Elaboration of the Land Transportation System of UDA," Doxiadis Associates (DOX-USA-A70), October 1969, pp. 51-54.
[2] Stanford Research Institute, *Future Urban Transportation Systems: Descriptions, Evaluations, and Programs*, p. 84.

[3] U.S. Department of Commerce, Bureau of Public Roads, Office of Planning, *Modal Split: Documentation of Nine Methods for Estimating Transit Usage*, Washington, D.C., December 1966.

Fig. 282

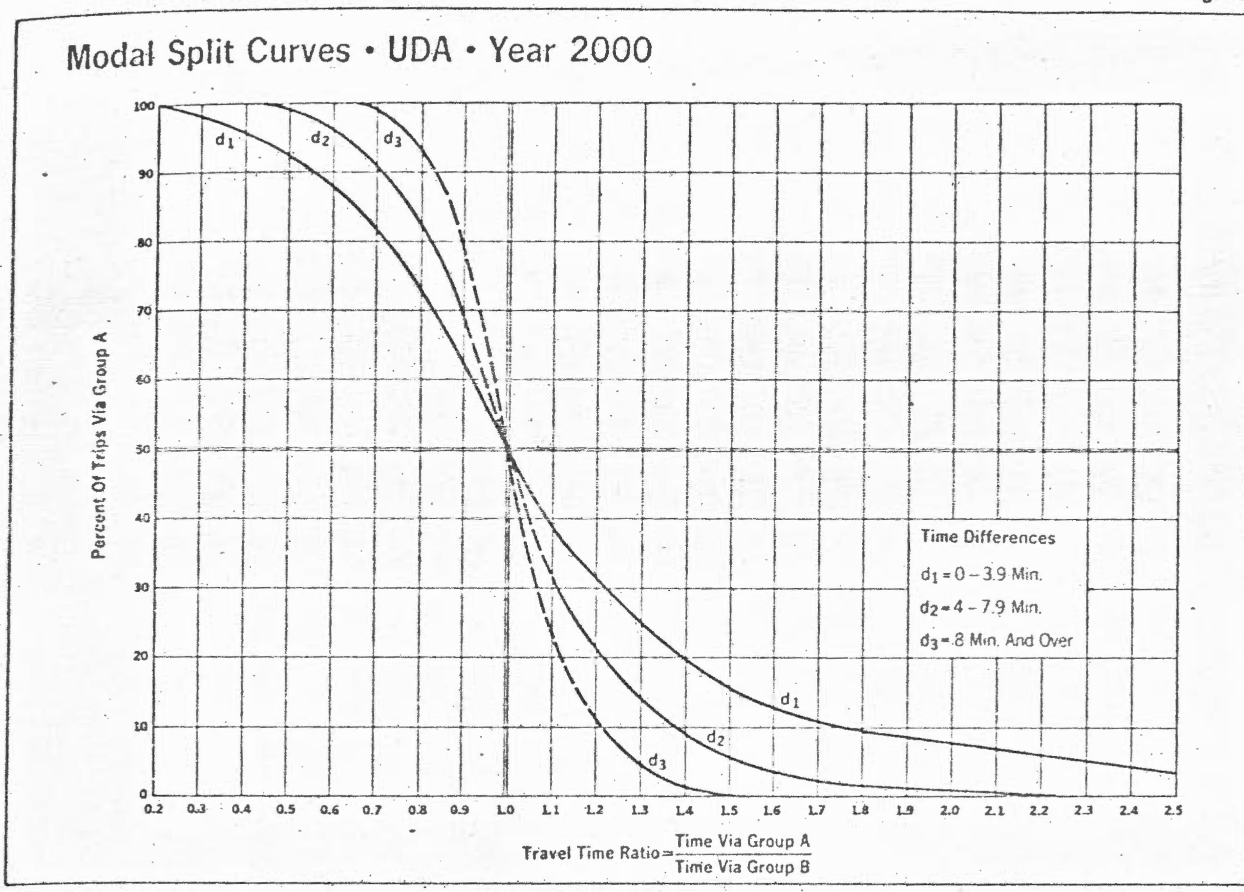


Table 45. Trip Production Rates, 1953, 1965 and 2000

	Average daily number of internal trips per person					
	1953[1] (3-county area)		1965[2] (7-county area)		2000 (37-county UDA)	
Trip purpose	Number	% of total	Number	% of total	Number	% of total
Work	0.59	36	0.48	25	0.50	20
Shopping and personal business	0.30	18	0.70	30	0.65	26
Social, recreation, school, eat meal	0.39	24	0.54	24	0.85	34
Non-home-based	0.36	22	0.49	21	0.50	20
Total internal trips	1.64	100	2.21	100	2.50	100

Note: [1]Michigan State Highway Department, et al., *Detroit Metropolitan Area Traffic Study*, Part I, July 1955.
[2]Southeast Michigan Council of Governments (SEMCOG), through its special project, the Detroit Regional Transportation and Land Use Study (TALUS), *Growth Change, and a Choice for 1990: Preliminary Plan, Southeast Michigan*, Volume 1, August 1969.

The year 2000 work-trip rate was determined on the basis of the assumption that the number of trips per employed person will be 1.30, i.e., the same as in 1965. The shopping and personal business trips per person were slightly decreased from the 1965 figure, taking into consideration that the need for such trips will be reduced; first, because of improvements in the distribution system of retail goods and because of advanced forms of communication, e.g., facsimile reproduction, closed circuit television; and second, because better organized local communities will increase the services provided within walking distance. Social–recreation–school trips were, however, increased considerably in continuation of present trends.

Trip Attractions

The assumptions made[1] concerning the parameters determining the trip attraction forces for each purpose

[1]"Elaboration of the Land Transportation System of UDA," Doxiadis Associates (DOX-USA-A70), October 1969, pp. 63–65.

lead to the following formulae which were used to compute person trip attractions for each purpose:

Home-based work trips = 1.302 × total employment

Home-based shopping and personal business = 2.239 × employment in services and agriculture

Home-based social, recreation, school, eat meal = 0.661 × population + 0.938 × employment in services and agriculture + 222.3 × park area (square miles) + 0.953 × universities' and large colleges' attendance

Non-home-based attractions = 0.25 × total home-based attractions for the other three purposes

Travel Times

It has been assumed that the maximum traveling time, in excess of which travel within UDA will be negligible, will be equal to 35 and 45 minutes for the high- and low-speed assumptions, respectively. The areas reached within this time from the Detroit CBD and the new twin urban center are illustrated in Figs. 283–286. The areas covered by the high- and low-speed assumptions will be almost identical. This confirms the hypothesis that people will take advantage of the higher speeds to reduce travel time rather than to increase trip lengths.

Fig. 332

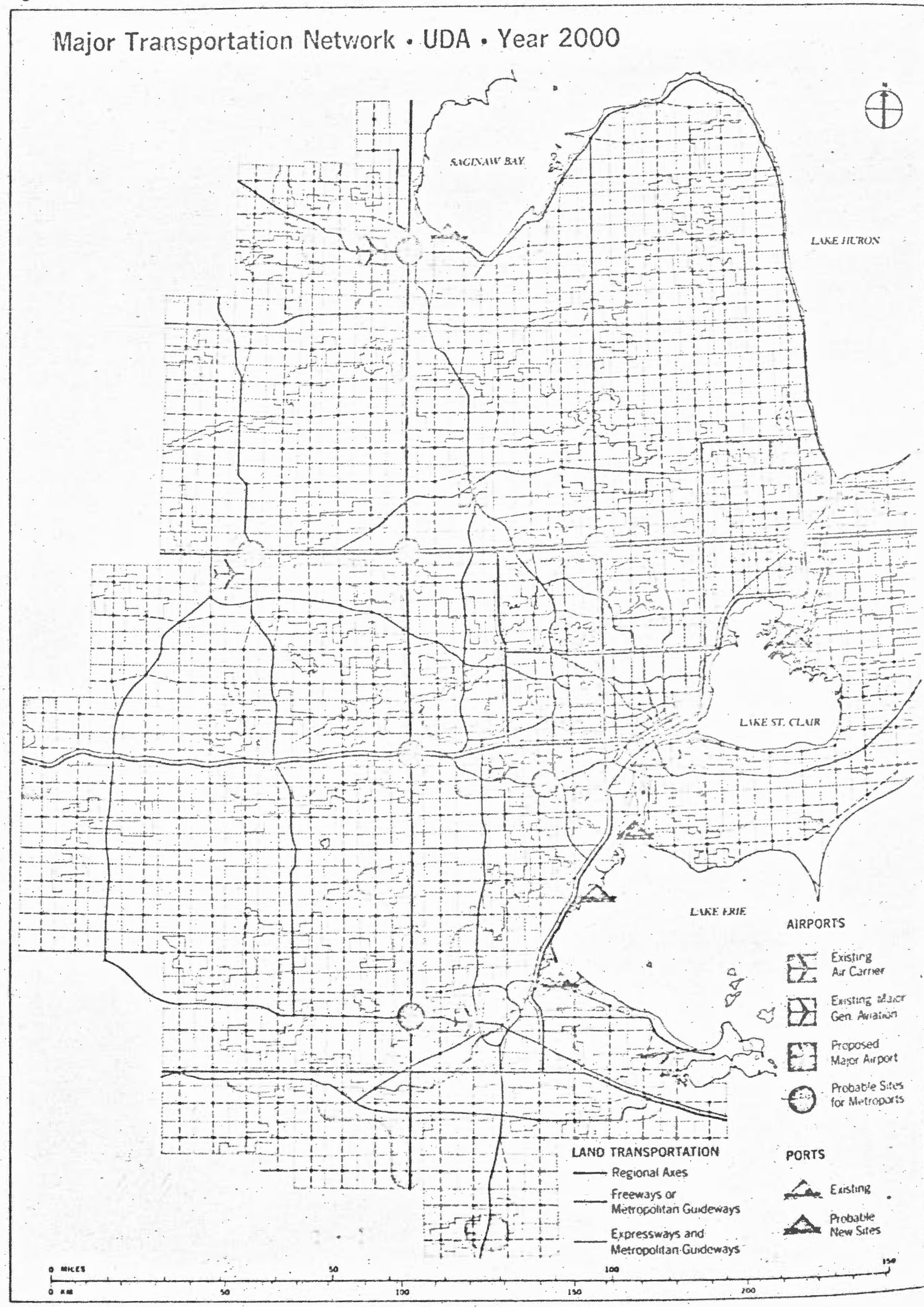
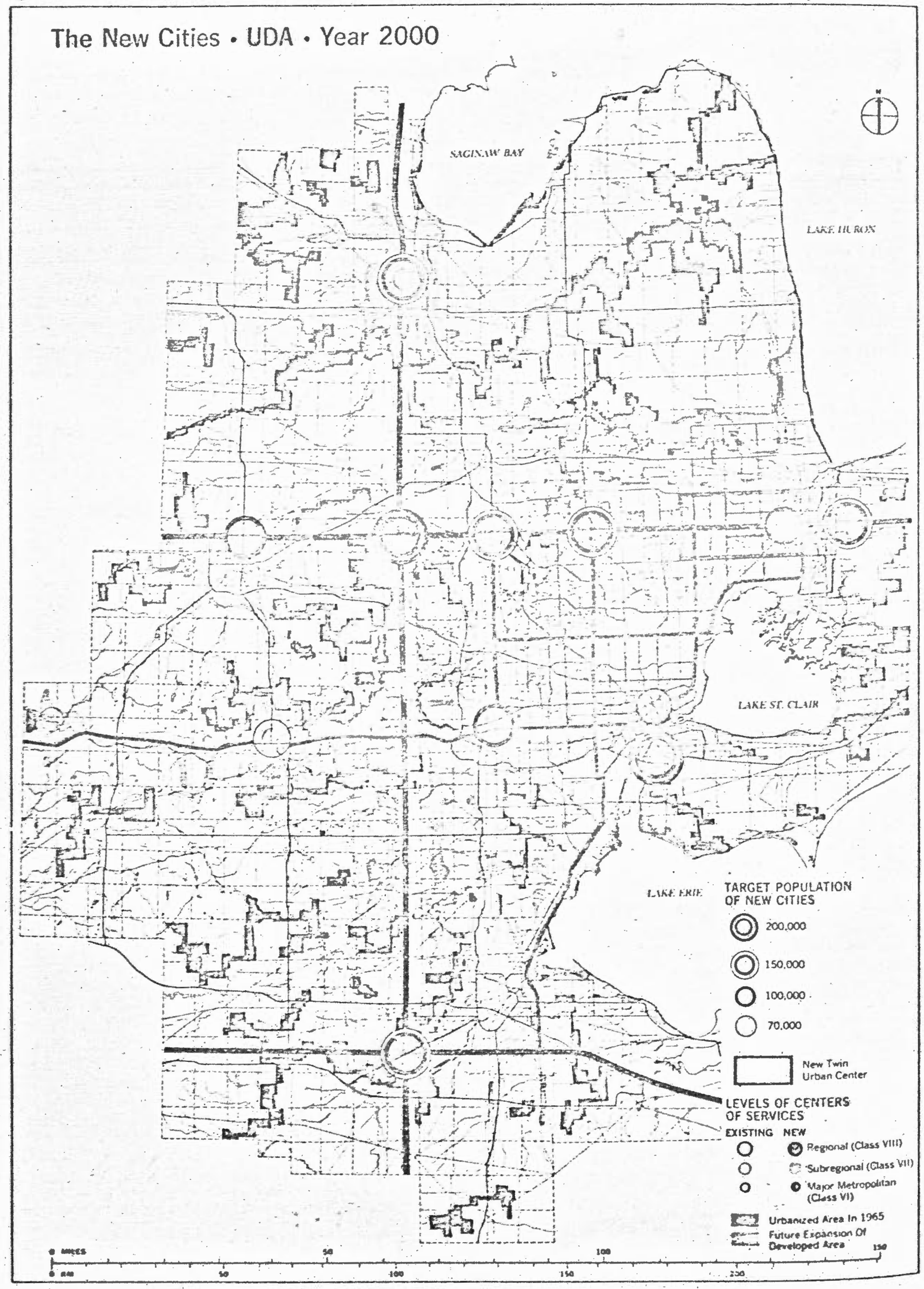

Major Transportation Network • UDA • Year 2000
SAGINAW BAY
LAKE HURON
LAKE ST. CLAIR
LAKE ERIE
AIRPORTS
Existing Air Carrier
Existing Major Gen. Aviation
Proposed Major Airport
Probable Sites for Metroports
PORTS
Existing
Probable New Sites
LAND TRANSPORTATION
Regional Axes
Freeways or Metropolitan Guideways
Expressways and Metropolitan Guideways
0 MILES
50
100
150
0 KM
50
100
150
200

Fig. 398



The New Cities • UDA • Year 2000
SAGINAW BAY
LAKE HURON
LAKE ST. CLAIR
LAKE ERIE
TARGET POPULATION
OF NEW CITIES
200,000
150,000
100,000
70,000
New Twin
Urban Center
LEVELS OF CENTERS
OF SERVICES
EXISTING NEW
Regional (Class VIII)
Subregional (Class VII)
Major Metropolitan
(Class VI)
Urbanized Area In 1965
Future Expansion Of
Developed Area

V. LONG RANGE TRANSPORTATION PLANS

A. SPECIFIC GOALS AND OBJECTIVES

The first section of this chapter deals with transportation objectives and standards. This discussion, however, is within the framework of the broader statement of goals and objectives which appears in Chapter III of this report.

The regional transportation system must be designed to serve the transportation demands currently generated within the region; must be capable of handling the transportation requirements that will be generated by the future land use plan; and must also aid in shaping patterns of regional growth and development along the lines of the recommended land use plan. Transportation must be the servant, rather than the master of regional patterns of growth and development.

To accomplish the first of these ends-to serve current demands-the transportation recommendations included in this report are designed to relieve the existing deficiencies in the highway transportation system through completion of those highway facilities under construction or committed; and by improving the level of service currently offered on the region's public transportation system.

The second general goal-to provide service to meet future demands-will be accomplished by implementation of the transportation recommendations relating to highway facilities needed beyond the 1975-80 commited network; and by providing the substantial public transportation improvements recommended for the regional bus network and for the introduction of a rapid transit system in the region.

The third of these ends-encouraging desired future developmental patterns-has been the basis upon which many of the post-1980 highway recommendations have been made. To some extent, these recommendations are required by existing and predictable patterns of development. But in other instances, new facilities and substantial improvements in existing facilities are recommended in order to stimulate development in particular parts of the region. These are generally related to the "new towns" proposals in the preliminary plan. In other cases, the use of transportation decisions to affect developmental patterns will be negative in character; recommending the limitation of the number of points of interchange on a freeway which penetrates potential recreation lands in order to decrease the urbanization pressures that would otherwise result, or by timing the construction of transportation facilities in order to affect the timing of development.

Our public transportation recommendations are designed to affect developmental patterns and to achieve social goals. The corridors served by the rapid transit system generally serve low-income areas at the residential end and areas of high employment potential at the other end. The areas between the terminal points are frequently low-income, low-mobility areas as well. To this extent, the provision of a high level of public transportation service serves social ends as well. Additional non-transportation benefits which we can expect to accrue from the provision of an extensive public transportation system are greater opportunities for increased levels of employment and commercial activities in the older downtowns served by the system, encouragement of high-intensity development at transfer and loading points, thus generating a less wasteful and scattered pattern of development throughout the region, and improving the level of mobility for the young and old who live in areas that will be served by transit.

Within the framework of these and other broader regional goals and objectives, this section deals with more specific objectives and standards for transportation.

Good transportation, can be defined as an integrated system of facilities that provide successfully for the movement of people and goods with a minimum of delay. Both private and mass transportation must be provided. Good transportation can be achieved only with adequate facilities placed at optimum locations.

Increasing accessibility widens the choice of residence and work opportunities. For employers, this means enlarging the size of the available labor pool: for the employee, a broadened choice of job opportunities for his skills, because existing and new areas would be brought within reasonable commuting time. Good transportation will increase the mobility of people affording greater opportunities to avail themselves of a wider selection of goods and services. This will increase both the volume and variety of demands for these goods and services.

Good transportation is safe transportation. By eliminating congestion and reducing conflicts among vehicles, it reduces both the enormous costs of policing traffic and the human and financial costs of traffic accidents. Good transportation must be capable of safely moving a large number of people in a short amount of time.

Good transportation is essential to the welfare of a metropolitan area. It then becomes a matter of identifying the most desirable means of achieving this end. To achieve this end, the following major criteria must be reviewed:

- A combination of all appropriate facility types and routes must be selected in order to satisfy total transportation requirements, within the constraints that people still have a choice of mode.

- The total pattern of transportation facilities must be so integrated that each type is most efficiently used.

- The economic justification for the extent and types of transportation facilities provided must lie in the accessibility, safety, economy and consistency with braoder regional goals of the total transportation system.

- The amount of land required for circulation facilities and the storage of vehicles must be minimized-especially where land costs are high, and substantial demands exist for other types of activities.

In formulating a solution to the total regional transportation problem, the appropriate roles of automobiles, buses and rail rapid transit must be identified by comparing the ability of each to best meet the needs of the travelers who create the over-all demand for transportation. Travelers can initially be classified into three fundamental categories: (1) Those to whom a private car is not available and who must use public transportation; (2) Those for whom no other transportation will do; such as doctors, traveling salesmen, service industry workers -- the entire category of those for whom the sustained use of the private motor vehicle is essential in their daily business. Also included are operators of trucks and other commercial vehicles; (3) Those to whom a private car is available, but whose requirements are simple round trips, such as home-to-work-to-home or home-to-shopping-to-home. These last have the option of choosing either their private cars or public transit if available, depending upon the levels of service provided, and the relative importance the trip-maker attaches to cost, convenience and flexibility.

1. Requirement: A Regional Freeway Network

Currently, the majority of trip-makers in the region fall into the second and third groups; people whose travel needs require the auto; and people who choose the auto because available public transportation is not satisfactory. An extensive and effective highway system is the first requirement in meeting these transportation demands. The known size of this group makes essential, as the first transportation requirement, a regional arterial highway system based on an extensive network of freeways. Construction, programming and planning of such regional freeways in the Southeast Michigan area is already well advanced. Plans to carry these to completion and supplement the system are strongly supported.

In measuring the ability of highways to meet the full demand for urban and interurban transportation, the level of highway service is not the single determinant. If highways are to function successfully, terminal facilities such as bus terminal and auto parking facilities must be so located and connected by high-capacity feeder streets to the arterial system that traffic flows freely to its final destination.

Home-based work trips comprise almost 25% of all weekday travel. The concentration of these trips during the morning and evening peak hours critically taxes highway facilities and periodically overwhelms local distribution streets and parking or bus station facilities in major centers of employment and commerce. This phenonenon is observable twice daily in the rush-hour congestion on city streets and freeway approaches in major urban centers. It is evident, too, in the seemingly insatiable demands for parking.

Table V-A-1

PASSENGER CAPACITIES PER LANE OR TRACK*
Based on "Capacities and Limitations of Urban Transportation Modes", Institute of Traffic Engineers, Washington, D.C., 1965

	Facility	Vehicles Per Lane per Hour		Effective Passenger Capacity at Average Occupancy Rate of:		
				1.25	1.75	2.00
PRIVATE AUTOMOBILE	City Street, Design Flow Rate	600		800	1,050	1,200
	City Street, Capacity	800		1,000	1,400	1,600
	Freeway, Design Flow Rate	1,600		2,000	2,800	3,200
	Freeway, Capacity	2,000		2,500	3,500	4,000
	Facility	Vehicles Per Lane per Hour	Headway (Min)	Effective Passenger Capacity at Average Loading Ratio of:		
				100%	125%	150%
TRANSIT BUS (50 Seats)	City Street	60	1.00	-	3,750	4,500
	City Street	90	0.67	-	5,750	6,750
	City Street or Expressway	120**	0.50	6,000	7,500	9,000
	Freeway	180**	0.33	9,000	-	-
	Type of Train	Trains per Hour	Headway (Min)	Seated Passenger Capacity		
RAIL-RAPID TRANSIT TRAIN	6-Car Train (80 Seats/Car)	20	3.00	9,600		
		30	2.00	14,400		
		40	1.50	19,200		
	10-Car Train (80 Seats/Car)	20	3.00	16,000		
		30	2.00	24,000		
		40	1.50	32,000		

*One direction. This table provides the elements necessary to determine the number of persons that may be accommocated per facility. This table considers capacity only. A more complete comparison must consider demand and level of service which reflect convenience, flexibility of use, comfort and many other factors.

**Capacity would be limited by design of bus turn outs and type of operation.

Table V-A-2

TRANSPORTATION SYSTEMS - COMPARISON OF CHARACTERISTICS*

ITEM OF COMPARISON	PRIVATE AUTOMOBILES	BUS RAPID TRANSIT	RAIL-RAPID TRANSIT TRAIN
1. For moving workers to and from CBD.	Requires expensive parking or long walk at CBD	Excellent for workers living near lines	Excellent for workers living near lines
2. For workers traveling on business	Essential	Not satisfactory for most such travel	Not satisfactory for most such travel
3. For movement of goods	Essential	Not satisfactory for most goods	Not satisfactory for most goods
4. For recreational travel	Essential for travel outside city	Not satisfactory in most cases	Not satisfactory in most cases
5. Coverage of area	Complete, with freeways, arterials	Good in medium-density areas - provides own feeders	Inferior in low-density areas
6. Travel time, door-to door, non-CBD trips	Best for most non-CBD trips	Poor except for trips along lines	Poor for most trips; requires transfers
7. Travel time, door-to-door, for CBD and large employment centers	Good to poor, dependent on congestion, distance to parking	Good for trips from zones near shops; fewer transfers	Good, for those trips from zones near transit stations only
8. Vehicle comfort	Excellent-private cars; driver cannot relax	Poorer, with less smooth operation	Superior, with passengers able to read newspapers, etc.
9. Effect on CBD development	Requires parking and would be impractical as only mode in large cities	Requires much more space than rail-rapid transit, for central area loading	Permits more compact development by not requiring parking in CBD

*Prepared by Parsons, Brinckerhoff, Quade & Douglas for Metropolitan Transit Authority of Maryland, Baltimore.

Planning the Transportation Systems

The development of the 1990 TALUS transportation plan was based on a number of factors and considerations including recognition of existing transportation systems, both highway and transit, present day travel characteristics and patterns, a measure of the existing transportation deficiencies, and the volume and spatial distribution of future travel demands in response to the land use plan. Previously, attention was directed toward deficiencies of the existing transportation system. The future transportation plan is intended to overcome these deficiencies as well as serve future requirements.

The 1990 land use plan is a crucial element in the determination of future transportation requirements. The land use plan defines the location and magnitude of the future population, employment and activity centers which are the basis for future year travel patterns. Thus the sum of present year deficiencies plus future year demands represent the total needs which any future year transportation system must meet. These two elements identify the additional needs of transportation facilities.

The planning of a highway transportation system must begin with the existing, under construction, committed, and previously planned facilities. This information was obtained from the Michigan Department of State Highways, the seven county road commissions, and the City of Detroit. Included are extensions of existing highways, major street improvements, and construction of new facilities. These facilities reflect decisions made prior to the TALUS recommendations. An examination of these facilities at the regional scale shows that in most instances they represent facilities clearly required to meet existing or predictable deficiencies and provide continuity and completion to existing systems.

The development of the transportation plan was closely interrelated to the development of the land use plan. The process by which the transit and highway plans have evolved are discussed below.

Development and Analysis Procedure of Highway Alternatives

As stated earlier, the basis for any future highway plan must be the existing and committed road system. This system was in fact an input into the regional growth model developed for this area, for use in determining accessibility to the land areas throughout the TALUS Study. The 1965 transportation system was also an input in the development of preliminary alternative land use schemes.

Various land use plans were matched against existing transportation facilities in a preliminary effort to relate levels of activity to highway facilities. During this process, first five alternative growth plans and later a single growth pattern was selected This land use plan was successively refined and is the basis upon which the highway and transit plans presented here were developed

With the given 1990 land use plan, two alternative highway systems were developed for testing purposed. These networks are defined as follows:

- 1990 Test Highway Network I - A minimal highway plan which relates closely to existing and planned levels of freeway and arterial facilities as determined by local and state highway officials with minor adjustments related to the preliminary 1990 land use plan.

- 1990 Test Highway Network II - A maximal highway plan which includes most of network Plan I plus substantial freeway facilities that have been identified as appropriate with the 1990 preliminary land use plan.

The purpose in developing two initial alternative test highway networks is to provide a means for subsequent selection of a final highway system. The evaluation and testing of two or more test networks allows the application of comparative analysis techniques to the selection from among highway or transportation system alternatives. The two test highway networks which have been prepared for testing represent as wide a range of highway system differences considered reasonable. Test highway system I represents what is considered to be a minimum highway plan based primarily on present construction and planning trends, whereas test highway Plan II represents a more extensive system of freeway facilities that relates more closely to the 1990 land use plan. Specific corridors have been identified where additional facilities, beyond those described in test highway network I have been defined. The total highway facilities contemplated in network II can optimistically be considered to represent a maximum level of highway construction activity through 1990.

These two networks were subjected to an evaluation process aimed at developing and selecting an interim highway plan. This evaluation process consisted primarily of the following elements:

(1) An evaluation of each system's capability to adequately serve the preliminary land use plan. In this step the configuration and capacity of each system was reviewed against the pattern of major land use elements to determine the degree of adequacy in serving those elements and the degree of compatibility of each system with those elements.

(2) A determination of the degree to which each system met both the overall study goals and objectives and those specific objectives and standards related to transportation. This of course involved the judgemental trading off of the positive and negative aspects of conflicting objectives and standards, a requirement of any plan selection process.

(3) An estimation of the cost of each alternative and an assessment of the capability of the region to support the plan considering the recent past history of expenditures for highways.

(4) A gross assessment of the ability of the plan to accommodate the expected level of travel demand. Unfortunately, time limitations permitted complete testing through the assignment of forecast travel patterns of only the selected interim plan. The selection of the plan, therefore, relied on a more gross assessment including overall levels of future trip making, anticipated regional vehicle-miles of travel reflecting changes in trip length, and an evaluation by major corridor of increases in capacity against current and anticipated future travel desires.

(5) An evaluation of the degree of compatibility between the highway plan and the concurrently developing transit plan. Modern rapid transit systems rely heavily on the capability for conveniently changing mode which in turn calls for provision by the street and highway system for extensive and adequate feeder bus service and station access by private automobile. Also, the region-shaping effects on both highway and transit systems ranging from area boundary formation caused by major highway facilities to changes in accessibility of various parts of the region afforded by both systems must be checked for mutual compatibility and, again, for reinforcing the spatial development goals called for by the land use plan. These aspects were also evaluated in the selection process.

The result of these five evaluation elements was the selection of a recommended interim highway plan. TALUS work plans call for additional assignments and testing of refinements and modifications to this interim plan preparatory to recommending a final plan later in 1969. These refinements and modifications will reflect both changes which may be made in the preliminary land use plan as well as comments and ideas obtained through an active interim plan review process to be undertaken with officials and interested citizens of the region.

Development and Analysis Procedure of Transit Alternatives

In contrast to the highway plan, the development of a future transit plan is much less dependent on the present configuration of the transit system, since the present system is virtually all bus and therefore much more flexible and capable of change. However, the 1990 transit plan must be based on a thorough understanding of the existing system and its usage characteristics. Further constraints in the development of the transit plan include applicable goals, objectives, and standards of the overall planning effort, the 1990 preliminary land use plan, and the co-emerging highway plan.

In similar fashion to the highway plan development process, two alternative plans were initially conceived in such a way as to "bracket" a reasonable expectation of a recommended plan. These two alternative plans were:

. <u>1990 Test Transit Network I</u> - representing a minimal transit plan for the future. This plan comprised an all bus system consisting of local, express, and inter-urban bus routes operating on the street and highway system.

. <u>1990 Test Transit Network II</u> - representing a maximal transit plan for the future. This plan consisted of an extensive, 118-mile rail rapid transit system located in region's most heavily travelled corridors supplemented by a local bus system plus a feeder bus network supporting the rail system.

In many ways the evaluation and study of these alternatives paralleled the study of the highway alternatives while in others the methods necessarily diverged. Thus, as in the highway evaluation, the transit plan selection process included:

(1) An assessment of each alternative in light of serving and supporting the land use plan.

(2) The ability of each plan to meet the established goals, objectives, and standards of the region.

(3) A determination of construction and right-of-way costs although this applied only to the rail system alternative and, unlike highway costs, could not be compared to past levels of spending.

(4) A concurrent evaluation of the degree of compatibility of the highway and transit plans.

The original transit system was extensive, including 118 miles of rail rapid transit in addition to bus service. Alternatives to this system were developed through modifications which consisted of successive reductions in the rail network. These alternatives were tested by a comparative evaluation of patronage considerations, total system cost, the relative importance of each corridor as related to the spatial distribution of major elements of the land use plan, system continuity and staging possibilities. The elimination of portions of the initially considered rail system assumes that high level surface transit operations, such as express bus service, will replace the eliminated rail lines. The initial extensive transit system and the system which was developed through the testing and evaluation process are shown in Figures which appear in the next section of this chapter.

The transit plan evaluation also included a study of the physical feasibility of elements of the most extensive system. This study, included site inspections as well as topographical, utility, and other map and data analysis is to determine the most appropriate means of construction; to determine feasibility, to narrow location alternatives, and to more accurately estimate costs.

Through these processes, an interim long range transit plan was prepared and is proposed for adoption. As with the highway plan, further testing and study considering changes in the land use plan, utilizing new "model" outputs and additional alternatives is necessary for development of the "final plan."

The 1990 projections in the tables above should be regarded as preliminary. The systematic transportation planning process which TALUS has employed consists of a chain of models, each providing output which becomes input to the succeeding model. These are discussed in the section on methodology. The first in this chain is the regional growth model, which predicts the spatial distribution and the characteristics of the resident population, of jobs, and of uses of land.

Ordinarily, months of intensive evaluation is required in order that growth model outputs can be analyzed in detail and the model equations, processing and logic be adjusted where appropriate.

Time constraints compressed this period to two weeks for TALUS. As a result, it was necessary to provide as input to the transportation planning stream growth model output which appears to have over-allocated employment and population to the four outlying counties. Of a total of 2.43 million jobs predicted for 1990, 1.91 million are allocated to Detroit and the three central counties and .52 million to the outlying four counties. This represents an increase of 346,000 jobs in the four outlying counties; from 171,000 in 1965 to 516,000 in 1990.

Further analysis of growth model output, of the interrelated equations used to allocate employment and population, and the assumptions and logic of the model will yield new model output which will undoubtedly reduce somewhat the allocations to the outlying four counties; and consequently increase the allocations to the three central counties and Detroit.

This will be particularly true of population and employment allocations in Detroit. Current model output does not adequately reflect the results of "renewal" in the City. Adjustments in the way that these policies will be "input" to the model will yield higher projections for Detroit from future growth model runs and achieve a greater degree of convergence as between the policies expressed in the plan and the output of the growth model.

If we assume (and this is purely an assumption) that as much as half of the 1965 to 1990 employment increase in the four outlying counties should be re-allocated, the resultant increase in Detroit and the three central counties would be slightly more than 8% of the amount now allocated. The proportionate reduction in the outlying counties would be somewhat greater, of course, amounting to about a third of the totals presently predicted. This would still mean an increase in total jobs of more than 100% over 1965. An increase of this magnitude or greater is by no means unreasonable. Residence employment in Macomb County increased from 35,000 in 1940 to 134,000 in 1960; and from 86,000 to 147,000 in Oakland County in the same period.

Whatever the magnitude of the "shift" that results from future growth model output, however, the direction of the shift will be to reduce the allocation in the four outlying counties and to increase it in the three central counties.

The trip generation model which is described in this chapter will also be subjected to further analysis and perhaps some modification. The results of the equations which have been employed are rates of person trips per household and per person which appear to be somewhat high when compared with results from other studies throughout the United States.

Trip generation model output is thus likely to be modified both by changes in the model itself and changes in the inputs to it. The new output will thus affect the subsequent models in the chain-trip distribution, modal split and the assignment models.

This is by no means untypical of the experience of other studies. Ordinarily, however, time is available after initial model outputs become available to subject the models to various tests of comparability and sensitivity and modify them as appropriate. These tests and detailed analysis are already under way and will be the basis upon which detailed refinement of the Final Plan will be developed. TALUS, however, is required, for a variety of reasons, to produce a preliminary plan at this time.

The results of the possible modifications discussed above, with respect to the 1990 projections in the tables above, will be:

Trips by purpose: a reduction in the number of assigned home-based work trips, since a larger proportion of work trips in Detroit and areas of relatively higher densities are "intrazonal" trips which are not included in highway assignments. A similar reduction in the number of "school" and "shop" trips would result for the same reason.

Trips by mode: The number of transit trips would increase and highway trips decrease since a high level of transit service will be available in Detroit and the three inner counties. The impact would be slight overall with respect to highway demands because of the magnitude of the base number; the increase for transit would be more significant, however, because it would represent a larger proportion of the currently projected transit total. This would be especially true of C.B.D. oriented trips.

Other effects of such a shift would be to reduce both average trip lengths, (especially for "work") and total vehicle miles of travel.

The spatial distribution of trips would be affected as well, with lower volumes in the four outlying counties and increases in Detroit and the three central counties.

In view of the magnitude of total trip demands predicted for 1990, when compared with the capacity of the highway network which is recommended in this preliminary report, it seems highly unlikely that the reductions would lead to the elimination of any of the facilities recommended or would reduce projected demand sufficiently to reduce the type of facility recommended to a lower functional classification.

Average speeds over the network would also be reduced, since a smaller proportion of total highway trips would occur in those areas where freeway speeds averaging in excess of 60 miles per hour are assumed. This would be a relatively minor factor in reducing average speeds, however, compared to the reductions that will be made for future tests in response to the volume-to-capacity ratios yielded by the current assignment.

C. THE SELECTED HIGHWAY AND TRANSIT PLANS

The Highway Plan:

Following the five basic evaluation elements outlined earlier, 1990 Test Highway Network II was selected and is recommended as the Preliminary Long Range Highway Plan. The Plan is shown in Figure V-C-1. For the sake of clarity, only those facilities classified as either freeways or major arterials are shown.

Any system of streets and highways exists to serve its attendant pattern of land uses. It, together with any elements of separate right-of-way public transportation which may be present, constitutes the only means of person-travel for trips longer than walking distance. It is essential, then, that the street and highway plan serve to not only reflect but to reinforce and further the desired land use pattern. There already exists, of course, an extensive system of streets and highways in the region and any rational plan must take full advantage of the past investment that these facilities represent. But in addition to doing so by maintaining or adding system continuity and by furthering a rational order of facility functions, new system additions must recognize the quantities and distributional patterns of high traffic generating elements of the future land use plan.

It is to be noted the recommended plan is preliminary in nature. Further study and detailing of the plan is intended which will consider the previously mentioned adjustments to the land use plan allocations and their resultant effect on travel forecasts as well as suggested modifications arising from review by interested officials and citizens of the region. However, the plan as proposed is considered adequate as a basis for planning decisions until these more detailed steps of study and analysis can be accomplished.

Plan Description

In general terms, the plan calls for a net increase of 348 miles of freeway to a 750-mile total, and a net increase of 230 miles of major arterials, yielding a 670-mile total in that category. While these two categories of facilities form the regional highway framework, accounting for the bulk of the highway investment requirements over the planning period and accommodating most of the region's vehicle-miles of travel, their construction will, of course, imply the accompanying construction of additional miles of lower class arterials, collectors, and local roads and streets.

The plan calls for a number of facilities beyond those proposed by the 1985 State Trunkline Plan prepared by the Michigan Department of State Highways. These additions are required to accommodate further growth in traffic volumes in response to the land use plan. In addition, many of the facilities previously contemplated must be built to higher capacity.

Initial freeway development in the TALUS region concentrated on the provision of radial facilities centering on the Detroit central area. As freeway construction proceeded outward from the central city, this initial radial pattern merged with a north-south, east-west grid system of freeways to form a combined radial-grid pattern. A major consideration in evolving proposed plan additions has been to preserve and fortify this basic radial-grid layout.

Following is a list of the more important new facilities proposed by TALUS' 1990 Regional Highway Plan:

Vernor-St. Jean Freeway: In the City of Detroit 5.7 miles from the existing Fisher Freeway at Gratiot Avenue to the Ford Freeway at Conner Avenue. For plan evaluation purposes, a six lane freeway with continuous service drives was assumed on alignment developed with the Detroit Department of Streets and Traffic. The intent of this limited access facility is to provide for the continuation of the Fisher Freeway through Detroit's core area. This facility would provide improved crosstown movement to Detroit's near east side industrial areas while sharing the Ford Freeway's function of serving the innermost cross-radial movements. Diversion of heavy through traffic from the surface arterial network would facilitate renewal activity in this corridor as called for in the land use and transit portions of the Comprehensive Plan. The inclusion of this freeway is in accordance with the Michigan Department of State Highway's 1985 State Trunkline Plan for system continuity.

Davison Conner Freeway: I-96 to I-94; 7.3 miles of freeway in the City of Detroit. Relief of the Ford Freeway through Detroit's core area while serving the east and northeast side industrial area is the intended purpose of this six-to-eight lane limited access facility. Acting in combination with the Ford and Jeffries Freeways, this circumferential link provides a freeway tie with the M-97, M-53, I-75 and Lodge Freeway corridors. This critical link in the freeway network would facilitate a high level of regional accessibility to the major industrial corridors called for in the land use plan while diverting excessive volumes from the Ford Freeway.

M-39 (Southfield) Freeway: I-94 to I-75 in the City of Allen Park. The 2.2 mile section of existing Southfield Road was evaluated under urban freeway characteristics. A freeway connector in this critical area will provide for logical system continuity with the existing Southfield Freeway while easing movement between the I-94 and I-75 Freeway corridors.

Metropolitan Airport Connector: 6.0 miles of east-west freeway in southern Wayne County joining existing I-75 with committed I-275. Consistent with the plans of Metropolitan Airport for additional terminal facilities, this proposed freeway will provide an alternative access point to the airport activities. Extensive industrial activity called for in the land use plan will be served by the facility. Inclusion of a freeway link in this corridor provides system continuity while diverting shorter east-west trip desires from the I-94 corridor.

M-153 (Ford Road Freeway): An 11.8 mile east-west limited access facility in mid-Wayne County. This freeway proposal in the Ford Road corridor was based on anticipated growth in intensity of land use development called for in the Land Use Plan. The addition of this high capacity facility would improve access to Dearborn centered employment and the proposed Canton Township new town center.

Additional study in this corridor should be made as plans for the development of the Ford Motor Company properties in Dearborn are completed.

Middlebelt Freeway: Metropolitan Airport Connector to U.S.-10 in Oakland County. This 29.5 mile freeway facility was evaluated in conjunction with the increasing north-south trip desires in western Wayne and Oakland Counties. Given emerging land use development patterns, freeway spacing considerations would call for a freeway type facility between the existing Southfield Freeway (M-39) and committed M-275. This proposed freeway would constitute a major portion of the regional radial-grid freeway pattern. As was pointed out in Chapter II-B, the capacity deficiencies in the Telegraph Road corridor will be difficult to relieve in the long range period without extensive capacity increases. This freeway will accomplish this by affording partial diversion of the increasing number of north-south trip desires from existing Telegraph Road. The anticipated intensive land use development centering around Metropolitan Airport would be facilitated by a freeway in this corridor.

M-275 Freeway: 8.5 miles of rural freeway in northwestern Oakland County connecting the committed terminus of M-275 at Highland Road with I-75 near Clarkston. Construction of this link will complete and reinforce the I-275-M-275 corridor connecting I-75 in northern Monroe County with I-75 in northern Oakland County. This facility will increase north-south accessibility to Oakland County while diverting through trips from the urban portions of I-75.

M-59 Freeway Corridor: From the existing M-59 Freeway at East Boulevard in the City of Pontiac to the U.S.-23 Freeway in Livingston County. Given the east-west travel demands generated by the Land Use Plan in Oakland County, a 26.7 mile freeway alternative was included in this corridor. This high capacity freeway link, while providing for continuity of movement across Macomb and Oakland Counties, would also be the primary access facility serving the proposed Highland New Town Center. Additional benefits gained from this freeway are: to provide currently needed improvement of east-west access to Pontiac based employment, to serve the county-wide activity associated with the City-County Service Center, and diversion of the heavy through traffic from the existing M-59, allowing for the extensive recreation development currently proposed along this highway.

Southfield Road Freeway: From Business Spur 696 (Northwestern) Freeway to I-696. System continuity and growing travel demands in this north-south corridor necessitate extension of the existing Southfield Freeway.

M-53 Freeway (Mound Road): Davison-Conner Freeway to existing M-53 Freeway at 18 Mile Road in western Macomb County. Consistent with the Department of State Highways Trunkline Plan, a 13.2 mile urban freeway was evaluated in northern Wayne and southern Macomb Counties. The Mound Road-Van Dyke corridor is currently increasing in importance as a new north-south radial. Given the anticipated level of 1990 industrial employment, normal freeway spacing considerations call for a major freeway facility in this corridor. Such a facility, while providing regional system continuity, will also reduce the amount of east-west traffic movement now necessitated by existing freeway spacing. Further, emphasis has been placed on Mound Road by inclusion of a rapid transit line. Consequently, intersecting with M-59, 16 Mile, I-696 and Davison-Conner Freeways, the Mound Road corridor becomes an important north-south transportation spine for Macomb County.

M-53 Freeway: From existing M-53 Freeway at 28 Mile Road to the northern Macomb County Line. This 10.6 mile north-south rural freeway section will facilitate through movement in the Mound Road-Van Dyke corridor. From a standpoint of system continuity, this facility is a significant link in the freeway system. A continuous freeway in this corridor will increase access to the major employment opportunities, recreation areas, and activity centers designated for western Macomb County by the Land Use Plan.

M-97 (Groesbeck Freeway Corridor): From Davison-Conner Freeway in the City of Detroit to the proposed 16-Mile Road Freeway in eastern Macomb County. Based on continuing growth of existing traffic in the M-97 corridor, a freeway was evaluated in terms of its effect on the overall system. While establishing route location may prove difficult, it appears unlikely that forecast north-south freeway travel demands can be adequately served on existing I-94 and the proposed Mound Road Freeway.

M-59 Freeway: From M-53 in the City of Utica to I-94 in eastern Macomb County. System completion considerations call for a 11.4 mile freeway link tying the committed portions of M-59 west of Utica to I-94 north of the City of Mt. Clemens. Such a facility will substantially improve east-west movement in the mid-Macomb County area while serving the increased employment opportunities associated with the Mound Road Corridor. This proposed freeway link will be a primary regional access link to the new activity center proposed around Macomb County Community College Central Campus.

16-Mile Road Freeway: A 14.0 mile proposed limited access facility tying I-94 with I-75 in Macomb and Oakland Counties. Under the assumptions of short range employment and residential growth in lower Macomb County, freeway spacing considerations currently indicate the need for a high-capacity, high-speed east-west facility parallel to and located between the committed I-696 and proposed M-59 Freeways. Utilizing the existing Metropolitan Beach Parkway and a 16-Mile Road alignment, the proposed freeway would tie the I-94, M-97, M-53 and I-75 corridors together. Such a facility would further regional accessibility to the high employment Mound Road Corridor and the regional recreation facilities of Metropolitan Beach.

M-21 Freeway: Existing M-21 Freeway west of the City of Port Huron to the western St. Clair County Line. This 22.7 mile rural freeway link will further regional accessibility to western St. Clair County. The completion of M-21 will provide an inter-regional freeway linkage of the Blue Water International Bridge in Port Huron with the Flint Metropolitan area.

I-94 Freeway Extension: A 13.0 mile rural freeway link from existing I-94 in the City of Port Huron north to the region's border. Accessibility to the recreational lands of Michigan's thumb area and Port Huron employment opportunities is the dual intent of this facility. With the completion of this freeway link the present heavy through traffic will be diverted from existing U.S.-25.

In addition to these freeway facilities, a number of new major arterials are included in the plan. These are high capacity roadways but lack the full access control feature of freeways. The more important of these are:

West Road: From M-85 to Sumpter Road in southern Wayne County. Establishment of West Road as a major east-west arterial serving the anticipated residential and industrial growth called for in the Land Use Plan.

Sumpter-Canton Center-Novi Corridor: From West Road in southern Wayne to West Maple Road in southern Oakland County. Development of a major north-south arterial in this corridor will complement the function of I-275 by providing a well defined facility for shorter trip movements. This corridor in conjunction with the West Road major arterial will be a primary intra-regional access link to the proposed activity centers in Belleville, Plymouth and Wixom.

Eureka-Savage Road: A major arterial from West Jefferson to Sumpter Road in southern Wayne County. This critical link in the major arterial system will aid in serving shorter distance east-west traffic related to the airport and nearby industry.

Maybee, Silver Bell, 26-Mile Road Corridor: A major east-west arterial link spanning mid-Macomb and Oakland Counties. The construction of a major arterial in this corridor is important to the continued development of this portion of the region. This facility would serve the Paint Creek New Town Center while increasing regional access to the extensive existing recreational facilities in this area.

Adams Road: Construction of a north-south major arterial from East Maple Road to Silver Bell Road in eastern Oakland County. Continued residential growth in this corridor coupled with the regional significance of Oakland University necessitate this facility.

Cost of the Plan

Based on current road-building experience in the region, an estimate was prepared of the cost of right-of-way and construction for the freeway and major arterial elements of the plan. Nearly all of the individual project cost estimates were supplied directly by the regions' operating street and highway agencies; namely, the Department of State Highways, the county road commissions, and the City of Detroit, using recent actual construction and right-of-way costs. The remaining facility costs were prepared by developing and applying average unit construction costs and typical right-of-way values using the supplied cost data.

These calculations indicate that for these two facility categories a total highway expenditure of $1,415,075,000 will be required during the period between 1975 and 1990. Of this total, $1,113,662,000 will be required for construction and the remaining $301,413,000 will be needed for right-of-way. Table V-C-1 summarizes these costs for each of the region's counties. The committed short range highway program which covers expenditures through 1974 is presented in the following chapter.

TABLE V-C-1

1975-1990 Anticipated Regional
Highway Expenditures*

	FREEWAY			TALUS MAJOR ARTERIAL			
	R-O-W	Construction	Total	R-O-W	Construction	Total	TOTAL
Wayne County Including City of Detroit	134,396,000	328,896,000	463,292,000	2,200,000	17,824,000	20,024,000	483,316,000
Oakland County	84,280,000	312,091,000	396,371,000	2,000,000	15,000,000	17,000,000**	413,371,000
Macomb County	50,829,000	190,183,000	241,012,000	853,000	23,157,000	24,010,000	265,022,000
Washtenaw County	3,503,000	63,506,000	67,009,000	2,000,000	10,000,000	12,000,000**	79,009,000
Monroe County	712,000	23,518,000	24,230,000	584,000	7,788,000	8,372,000	32,602,000
St. Clair County	7,613,000	47,260,000	54,873,000	2,632,000	14,247,000	16,879,000	71,752,000
Livingston County	9,600,000	55,569,000	65,169,000	211,000	4,623,000	4,834,000	70,003,000
	290,933,000	1,021,023,000	1,311,956,000	10,480,000	92,639,000	103,119,000	1,415,075,000

* Cost estimates represent Michigan Department of State Highways, County and City expenditures only on the TALUS designated freeway and major arterial system. Figures presented are based on 1969 cost estimates. Costs represent only new construction or major re-construction, normal system maintenance is not included.

** TALUS estimated costs.

Future Volumes and Capacities

As pointed out previously, the number of trips generated per person in the region is expected to increase moderately and the average length of these trips will increase substantially. When these factors are combined with the 57% growth in population anticipated, a near trebling of the vehicle-miles of travel in the region occurs. It is the task of the highway plan to accommodate these large traffic volume increases.

In order to assess the capability of the plan to meet this need, a forecast of 1990 travel was prepared and "assigned" to it. Representing the other side of the equation, street and highway capacities reflecting "level of service D" for the urbanized parts of Wayne, Oakland and Macomb Counties as defined in 1965 Highway Capacity Manual[1] were calculated. Capacities in the remaining portion of the region were based on "level of service C". These "levels of service" are discussed in Chapter II-B. These latter were adjusted to a 24-hour basis for direct comparison to the volume forecasts through the assumption of 8% relationship between peak hour and 24-hour volumes. This 8% value, a reduction from the 10% factor found in 1965 corresponds to a similar reduction in the proportion of all trips constituted by work trips, since travel to and from work is the primary cause of travel peaking.

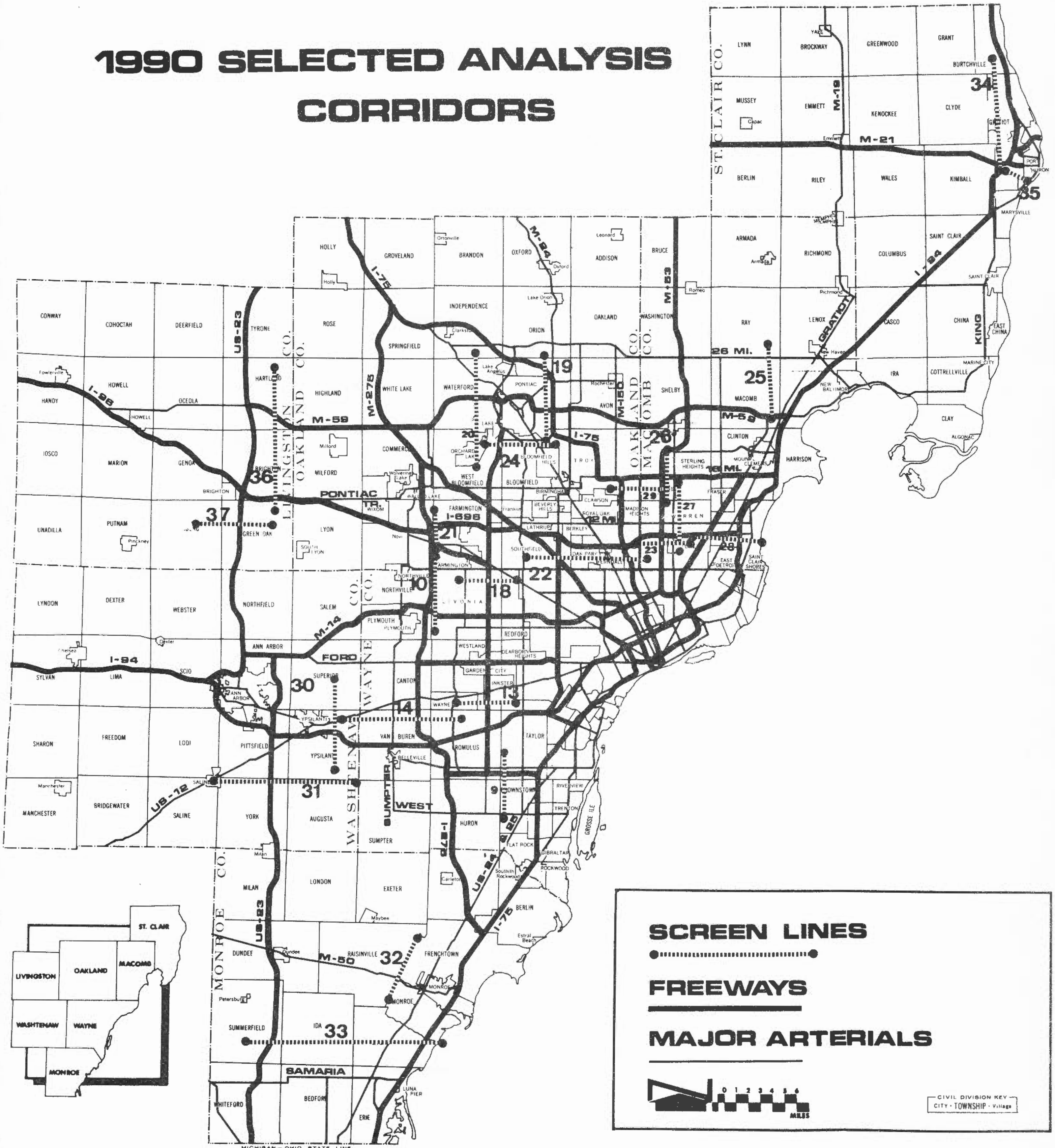
Figures V-C-2 and 3 identify a series of 37 corridor screenlines which were used as a basis for summarizing the resulting volumes and capacities. The volume and capacity values are shown in Table V-C-2. Study of these exhibits reveal that sufficient capacity exists to accommodate the volumes in most areas of the region. However, some problem areas are evident. As mentioned earlier, the forecast travel volumes shown here must be regarded as preliminary in nature. It appears likely that certain anticipated adjustments in the model "chain" will reduce somewhat the forecast level of highway travel demand in some areas. However, these problem areas warrant further study and consideration.

Most of the corridors exhibiting volume-to-capacity ratios exceeding 1.00 are located in the shaded area indicated on the small map below.

[1] Highway Capacity Manual, U.S. Bureau of Public Roads, U.S. Government Printing Office, 1965.

FIG. V-C-2

1990 SELECTED ANALYSIS CORRIDORS



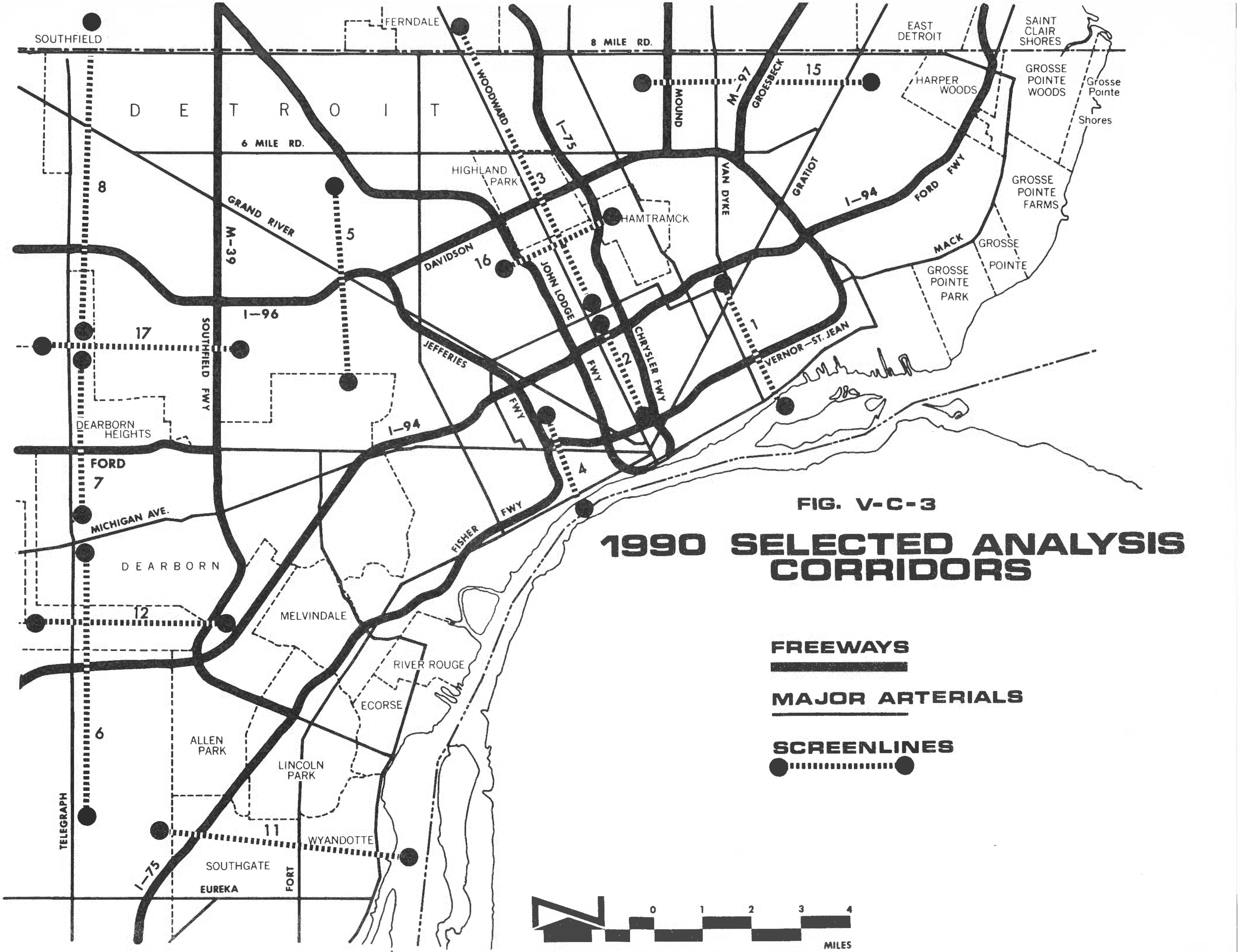


FIG. V-C-3

1990 SELECTED ANALYSIS CORRIDORS

TABLE V-C-2

1990 ASSIGNMENT NETWORK ANALYSIS CORRIDORS

Screenline Number	Future Analysis Corridors	1990 Assigned Volume	Computed Capacity	V/C Ratio
1	Vernor-St. Jean Freeway east of East Grand Boulevard	241,640	358,900	.67
2	Ford and Fisher Freeways east of Woodward	448,413	467,530	.96
3	Davison Freeway, 8 Mile Road east of Woodward	741,098	429,790	1.72
4	Fisher Freeway, Fort Street east of Jeffries Freeway	314,949	499,000	.63
5	Jeffries Freeway, Grand River east of Schaefer	864,854	493,300	1.75
6	Michigan, Ford Freeway east of Telegraph Road	261,560	253,170	1.03
7	Ford Road east of Telegraph Road	236,261	209,800	1.13
8	Jeffries Freeway, Grand River, 8-Mile Road east of Telegraph Road	766,893	514,100	1.49
9	Eureka, Airport Connector, West Road east of Inkster Road	125,920	189,770	.66
10	I-96 Freeway east of I-96, I-275 Junction	442,990	387,300	1.14
11	I-75 Freeway north of Eureka Road	470,240	254,200	1.85
12	Telegraph and Southfield Roads north of I-94	176,178	200,800	.88
13	Middlebelt north of I-94	266,802	203,570	1.31

Screenline Number	Future Analysis Corridors	1990 Assigned Volume	Computed Capacity	V/C Ratio
14	Belleville, I-275 Freeway, Wayne Road north of I-94	114,740	216,470	.53
15	Mound Road, Groesbeck, Gratiot south of 7 Mile Road	592,325	477,600	1.24
16	Lodge and Chrysler Freeways south of Davison	396,492	460,700	.86
17	Telegraph and Southfield Roads south of Joy Road	257,708	219,400	1.19
18	Middlebelt south of 7 Mile Road	328,942	218,000	1.51
19	M-59 and I-75 Freeways west of I-75	297,190	329,900	.90
20	M-59 Freeway west of Telegraph Road	139,560	229,300	.61
21	Grand River, I-696 Freeway east of M-275, I-96 Junction	112,980	150,800	.75
22	Southfield Road, Chrysler Freeway south of 9 Mile Road	722,390	675,000	1.07
23	Mound Road, Van Dyke south of 10 Mile Road	355,918	241,000	1.48
24	Middlebelt, U.S.-24, U.S.-10 south of Square Lake Road	245,340	229,100	1.07
25	26 Mile Road, M-59 Freeway east of North Avenue	73,297	137,200	.53
26	18 Mile and 16 Mile Roads east of Mound Road	131,467	190,400	.69
27	12 Mile Road, I-696 Freeway east of Van Dyke	274,218	214,900	1.27

Screenline Number	Future Analysis Corridors	1990 Assigned Volume	Computed Capacity	V/C Ratio
28	Groesbeck, Gratiot, I-94 Freeway north of 10 Mile Road	392,245	334,600	1.17
29	I-75 Freeway, Mound Road, Van Dyke north of 14 Mile Road	426,130	277,600	1.54
30	I-94 Freeway, U.S.-12 west of Wayne County Line	354,029	146,000	2.42
31	U.S.-23 Freeway south of U.S.-12	131,102	105,610	1.24
32	M-50 west of U.S.-24	27,030	41,100	.65
33	U.S.-23 and I-75 Freeways south of City of Monroe	204,640	175,800	1.32
34	M-21 east of I-94 Junction	31,190	61,600	.51
35	Branch U.S.-25 south of M-21	70,780	89,100	.79
36	M-59, I-94 Freeway east of Pleasant Valley Road	174,856	232,600	.75
37	U.S.-23 Freeway south of I-96	76,020	51,700	1.47

Study of travel patterns in this area reveals that as urban development fills in the now lightly developed areas between the Detroit-centered radial freeways, a large amount of cross-radial desire, as contrasted to radial movement, it generated. Many of these trips, though not destined for the City of Detroit, are attracted by high speeds to the corridor described generally by the Mound, Davison and Schoolcraft alignment. However, both the Mound and Schoolcraft Freeways serve as important carriers or radial desires as well. The coincidence of these two major movements in the same corridors result in very large traffic volumes. Thus, if after further refinement of the estimate of future travel patterns this problem remains, it would appear desirable to consider and incorporate alternative means of accommodating these cross-radial movements in preparing the final highway plan.

Two other problems occur at Screenline 31 which cuts across the U.S.-23 corridor in southern Washtenaw County and at Screenline 11 which bisects the I-75 corridor in southern Wayne County. Preliminary study suggests that high traffic volumes in these corridors will reduce substantially upon further refinement of the forecasting process. However, again the potential need for additional capacity in these areas will be carefully considered in formulating the final highway plan recommendation.

The addition of a substantial amount of high speed freeway facilities will reduce the time of travel required for many highway trips in the future. Figure V-C-4 shows a comparison of travel times ranging outward from the Detroit CBD in 1965, 1975 and 1990. Counteracting the effect of increased speeds due to freeway additions is the speed reducing effect as growing areas of land become urbanized. Thus, in some corridors where facility improvements will be largely completed by 1975, speeds actually reduce slightly by 1990. Most corridors, however, evidence speed improvements over the planning period.

VI. SHORT RANGE TRANSPORTATION PROGRAM

A. SHORT RANGE HIGHWAY IMPROVEMENTS

A basic assumption in the development of the 1990 Land Use Plan was the effect of the 1975 committed highway network. The anticipated construction of critical portions of this network in the next five years in essence creates a framework for future land use developments, since the highway system is a major determinant of land use development patterns. Completion of critical links in the freeway system will modify travel patterns in the future, assisting in the development of a coordinated total street and highway system. While all roads in the TALUS area are considered in the planning process, freeways and major arterials only are discussed in this short range program since they represent the majority of total needed road construction expenditures and have the greatest region-shaping impact.

The following list of the more significant projects represents both the recent past and a short range program for the future that reflects currently viewed priorities, needs, and resources for the period between now and 1975. Figure VI-A-1 shows these and other highway improvements covering both periods. These cost estimates are presented to place in perspective an important area of public expenditure - the street and highway system.

Freeway Construction Completed in the Period 1965 Through 1969

I-75 Freeway: A 6.2 mile section of north-south freeway from existing I-75 at I-94 in the City of Detroit to the proposed I-696 - I-75 interchange in southern Oakland County. This freeway completes a major portion of an important freeway radial extending northwestward linking Detroit's CBD with Oakland County.

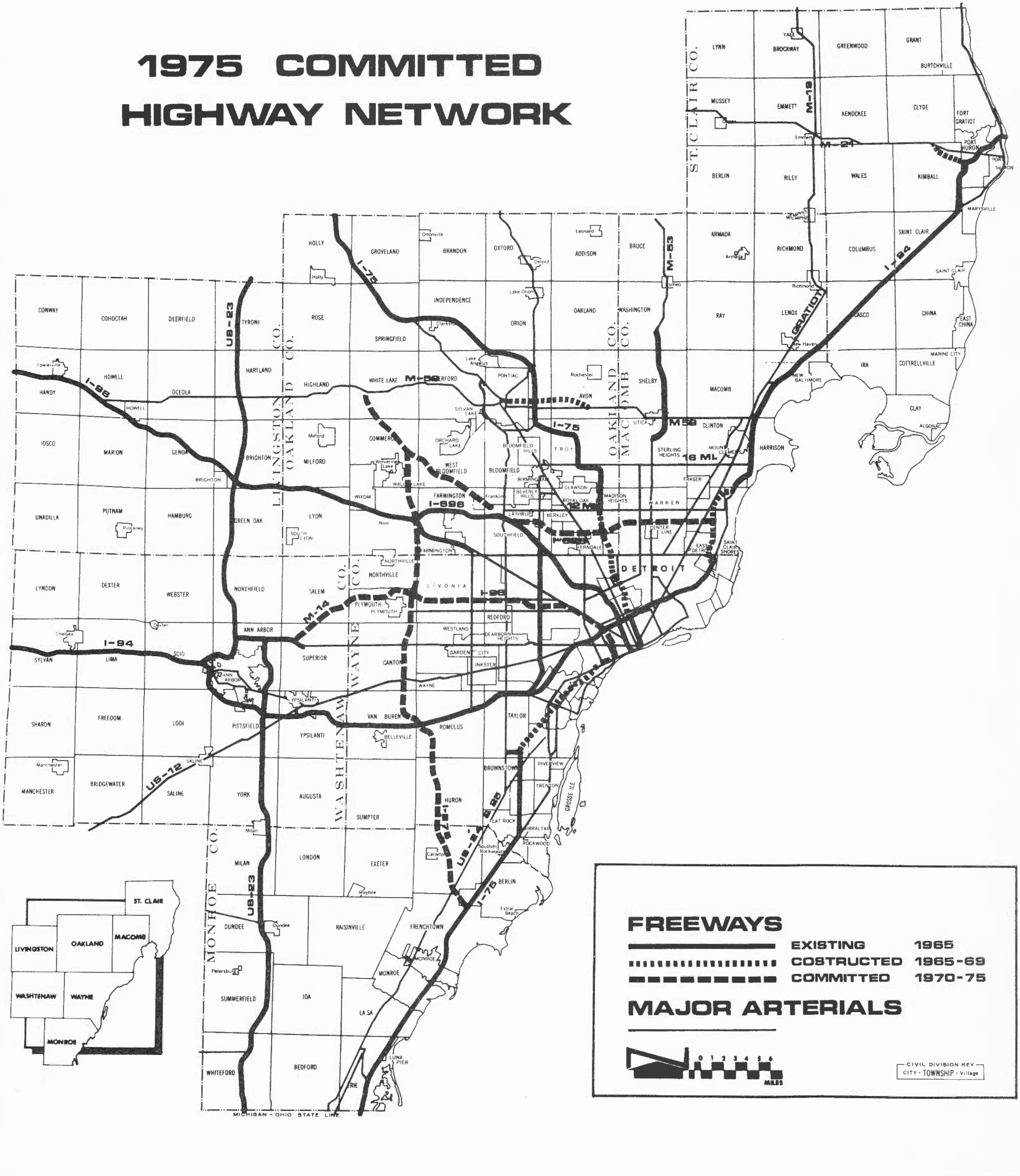
I-75 Freeway: A 13.3 mile freeway section from existing I-75 at Eureka Road in southern Wayne County northeasterly to West Grand Boulevard in the City of Detroit. This important link in the Interstate system spans Detroit's downriver industrial area and provides increased accessibility to Detroit's core area.

I-94 Freeway: From 8-Mile Road to 14-Mile Road in southern Macomb County This 6.8 miles of freeway represents the completion of the final link of I-94 from the Blue Water Bridge at Port Huron, through Detroit, to the Indiana Border.

M-21 Freeway: From Lapeer Road to 24th Street in St. Clair County. Completion of this 6.7 mile project represents the first link in proposed east-west freeway between Port Huron and Flint.

FIG. VI-A-I

1975 COMMITTED HIGHWAY NETWORK



Freeway Construction Programmed for the Period 1970 Through 1974

I-696 Freeway: From Business-696 (Lodge-Northwestern) to I-94: This 18.9 mile freeway will serve the heavy east-west travel demands in southern Oakland and Macomb Counties and provide continuity of freeway movement. A key link in the regional freeway system, I-696, will interchange with the I-94 - M-97 - M-53 - I-75 and M-39 forming a major portion of the east-west freeway grid pattern.

I-75 (Fisher Freeway): From West Grand Boulevard to Gratiot Avenue. Construction of this 5.4 mile section of freeway will complete I-75 in the region. This important link in the freeway system completes inner freeway loop encircling the Detroit CBD.

I-96 (Jeffries Freeway): From I-275 in Western Wayne County to the Ambassador Bridge. A 22 mile major freeway project serving the Grand River and Schoolcraft Corridors and substantially improving regional accessibility for western Wayne County.

I-96: The short north-south section extending between I-275 and M-275, which completes the bypass alignment comprised of these two freeways.

I-275 Freeway: From I-75 in Monroe County to I-96 in western Wayne County. This 30.0 mile north-south section of freeway represents a major portion of the Detroit area bypass. Completion of this facility will increase accessibility to Metropolitan Airport and western Wayne and Oakland Counties.

M-14 Freeway Extension: A 12.0 mile freeway connecting the existing portion of M-14 in the Ann Arbor area to the I-96 and I-275 Freeways. This freeway comprises the extension of the I-96 corridor west to Ann Arbor. Completion of this freeway provides a necessary alternative to the I-94 route from Detroit to the Ann Arbor area.

Northwestern Freeway: From M-275 to I-696. A 9.6 mile freeway that will extend the Lodge Freeway to M-275 in western Oakland County. Extension of this radial will serve the anticipated future growth of western Oakland County and provide access to major recreation areas.

In addition to these major freeway projects, important street and highway improvements of lower capacity classification are included in the program. Table VI-A-1 indicates all program costs for the freeways and major arterials included in the TALUS 1975 Committed Highway Network. Right-of-way and construction costs are listed by county for the 1970-1975 period.

TABLE VI-A-1

1970-1975 Anticipated Regional
Highway Expenditures*

	FREEWAY			TALUS MAJOR ARTERIAL			
	R-O-W	Construction	Total	R-O-W	Construction	Total	Total
Wayne County including City of Detroit	86,395,000	501,977,000	588,372,000	3,393,000	243,163,000	246,556,000	834,928,000
Oakland County	55,855,000	144,662,000	200,517,000	6,573,000	133,947,000	140,520,000**	341,037,000
Macomb County	23,637,000	82,460,000	106,097,000	3,064,000	52,846,000	55,910,000	162,007,000
Washtenaw County	-	6,281,000	6,281,000	1,541,000	11,193,000	12,734,000	19,015,000
Monroe County	971,000	16,500,000	17,471,000	741,000	23,118,000	23,859,000	41,330,000
St. Clair County	-	-	-	1,306,000	13,388,000	14,694,000	14,694,000
Livingston County	-	-	-	-	-	-	-
	166,858,000	751,880,000	918,738,000	16,618,000	477,655,000	494,273,000	1,413,011,000

* Cost estimates represent Michigan Department of State Highways, County and City expenditures only on the TALUS designated freeway and major arterial system. Figures presented are based on 1969 cost estimates. Costs represent only new construction or major reconstruction, normal system maintenance not included.

** TALUS estimated costs.

This table shows that a high level of highway construction spending is anticipated over the next few years, with $183,476,000 required for right-of-way and $1,229,535,000 for construction. This high level of expenditure, in comparison to past periods, is largely due to the increased proportion of freeway mileage in Detroit and highly developed parts of Wayne County.

These are projects for which location, design and approval decisions were made years ago, but the complexities of the preliminary work in such projects delay the heavy construction outlays.